

COMPENDIUM OF INDIAN MEDICINAL PLANTS

VOLUME 1
1960 - 1969

Ram P. Rastogi
B.N. Mehrotra



Central Drug Research Institute
Lucknow
and
Publications & Information Directorate
New Delhi
1991

ABOUT THE COMPENDIUM VOL.1

02261

This detailed treatise is written for botanists, chemists, biologists as a companion volume to "Glossary of Indian Medicinal Plants" by Chopra, Nayar & Chopra, and covers the ten-years period 1960-69.

While following the general format of the 'Glossary', taking cognisance of the widespread spurt in research on medicinal plants, the write-up on each plant also includes new type of data/information. Two new sections have, therefore, been added — a section on 'New Compounds' gives the chemical structures of new compounds isolated and a section on 'Biological Activity' summarises the biological work on pure constituents isolated from a plant. These sections would add immensely to the usefulness of the Compendium.

The first part of the volume presents the logistics of the write-up in an 'Explanatory Note', which is followed by the description of almost 1200 plants in 442 pages. Finally, three indexes (155 pages) comprising local names, chemical constituents and biological activities have been provided.

The volume will be welcomed by all those working on medicinal plants/natural products who will appreciate that such a wealth of information has been assembled in a classified manner in a single volume.



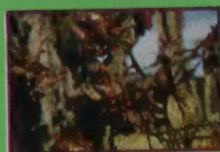
Boerhaavia diffusa



Centella asiatica



Costus speciosus



Abrus precatorius

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**COMPENDIUM OF INDIAN
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VOL. 1

1960 - 1969

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R .P. Rastogi

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EXPLANATORY INTRODUCTION

SCOPE

This compendium has been designed as a companion volume to Glossary of Indian Medicinal Plants by Chopra, Nayar & Chopra (hereinafter referred to as Glossary). All the plants have been listed in alphabetical order and reference to the Glossary has been given for those plants which are included therein; in the case of new plants, not listed in the Glossary, their local names and distribution have also been included, wherever known, in keeping with the pattern of the Glossary. The distributional range of such plants has been confined to the present political boundary of India. Bhutan and Nepal have also been included because these countries fall within the unbroken chain of the Himalayas and some of the Himalayan species occur in contiguous territories in India, Bhutan and Nepal. Certain plants, although not found in India, are included either because these were listed in the Glossary or are sold in indigenous drug market in India.

The literature cited is on the basis of complete screening of Chemical Abstracts and Biological Abstracts and covers the ten- year period from 1960 to 1969. It has been aimed to make the compendium exhaustive by including research done anywhere in the world on the taxa found in India, whether indigenous or introduced.

LITERATURE CITATION

The abbreviations of the reference citations are in accordance with the practice followed in Chemical Abstracts and Serial Sources for the Biosis Data Base, Volume 1985. Since many journals, especially those published in Latin American, African and South-east Asian countries, are not available in most Indian libraries and some journals have stopped publication or have changed their names, cross reference to Chemical Abstracts have been given in such cases.

BOTANICAL NOMENCLATURE

Since the nomenclatures of many plants have undergone revision in the preceding decades, the names of plants, including those given in the Glossary and in the cited references, have been updated as far as possible to provide currently accepted names. In cases of change of name, the obsolete names have been given as synonyms according to the following order: the currently accepted name is followed by the name given in the Glossary and then by the

corresponding name listed in Hooker's Flora of British India or other subsequent relevant literature as addition to Indian flora (if it is different from the name listed in the Glossary), and finally by the title name of the plant given in the reference cited, if it is different from the earlier mentioned names. Similarly, the names of the natural orders (families) have also been revised wherever required according to the currently accepted pattern.

There is divergence of opinion among Indian botanists on the merits of maintaining or splitting of a few large genera like *Bauhinia*, *Euphorbia* and *Polygonum*. In order to decide their proper status, detailed taxonomic investigations of the species are required. In this compendium, therefore, their existing generic status has been maintained.

The Plant names mentioned under synonymy, in case of name change, have been inserted in their alphabetical order and cross references to their currently accepted names have been given to facilitate search for any particular plant on which information may be required.

STRUCTURES

Structure of some substances have been revised and in many cases absolute stereostructures have been determined in the post-1969 years. To provide complete information to the readers and also to avoid duplication in the second volume (1970 to 1979), an attempt has been made to present current structures with the relevant post-1969 references, wherever applicable.

INDEXES

Besides indexes of local names and chemical substances isolated, an additional index of biological activities has also been provided to enhance the usefulness of the compendium to all classes of readers.

In the index of chemical compounds, trivial names are used, wherever given, and no attempt has been made to include systematic names. Synonyms, as far as they have come to our knowledge, have been included in the index via "see". Substances unnamed by their discoverers have been listed simply by plant origin, e.g. 'Anethum coumarin I'. Since the list contained about 3600 entries, help of computer has been taken to prepare an alphabetised list. A suitable computer programme has been developed for this purpose. Thus, the name of the compound is arbitrarily divided into 3 components - the basic name, prefixes such as d,l, cis,trans, α , β etc. and substituents. Each substance has been indexed as far as possible under its basic name. Example : d- α -cadinene is indexed as cadinene, d-alpha-; O-demethyl- β -lumicolchicine as lumicolchicine, beta-, O-demethyl; 2-methyl-5-methoxy-1,4-naphthoquinone as naphthoquinone, 1,4-,2-methyl-5-methoxy.

SPECIAL FEATURES

In view of the fact that since 1960 research on plants, both from the chemical and biological aspects, has been much more exhaustive than earlier, the pattern of the write-up on each plant has been suitably modified to include the new type of data/information. Besides summarising

the results of biological evaluation of total extracts and fractions thereof and of chemical studies, each write-up has two new sections wherever necessary. A section on 'Biological Activity' gives a summary of all the pharmacological, biological and clinical work done on the pure constituents obtained from a plant and a section on 'New Compounds' gives the complete structures of any new substances isolated. It is hoped that these two new sections would add immensely to the usefulness of the compendium by highlighting the results of chemical and biological studies on each plant in a systematic manner.

Central Drug Research Institute
Lucknow
October, 1988

R. P. Rastogi
B. N. Mehrotra

ABELMOSCHUS (Malvaceae)

A. esculentus (L.) Moench. syn. *Hibiscus esculentus* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 1).

Nine flavonol glycosides - quercetin-4'-glucoside, quercetin-7-glucoside, quercetin-5-glucoside, quercetin-3-(O-glucosylglucoside)-4'-(O-glucosylglucoside), quercetin-3-(di-O-glucosylglucoside), quercetin-5-(O-rhamnosylglucoside), gossypetin-8-glucoside, gossypetin-8-(O-rhamnosylglucoside), gossypetin-3-glucoside-8-(O-rhamnosylglucoside) - and two anthocyanins - cyanidin-4-glucoside and cyanidin-3-glucoside-4'-glucoside - isolated from flower petals (*Am. J. Bot.* 1968, 55, 431; *Chem. Abstr.* 1968, 69, 19476 f)

A. moschatus Medik. syn. *Hibiscus abelmoschus* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 1).

Myricetin-3'-glucoside and a glycoside of cyanidin identified in flowers (*Curr. Sci.* 1964, 33, 431); an aromatic absolute obtained from seeds (*Res. Ind.* 1964, 9, 325).

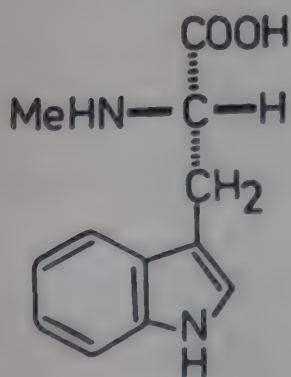
ABRUS (Papilionaceae)

A. precatorius L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 1).

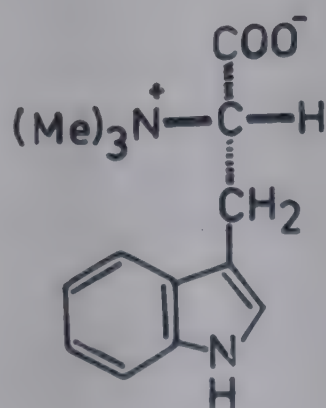
Reputed for antitumor properties in Ayurvedic medicine (*Indian J. Med. Res.* 1968, 56, 445).

Precol, abrol and two alkaloids - abrasine and precasine - isolated from roots (*Sci. Res.* 1966, 3, 203; *Chem. Abstr.* 1967, 67, 90987 n); gallic acid, abrine, hypaphorine and another alkaloid, mp. 143°, from seeds (*Tai-wan ihsueh-huitsa-chih*, 1960, 59, 868; *Chem. Abstr.* 1961, 55, 17770 r); presence of alanine, serine and valine in seeds (*Pakistan J. Sci. Ind. Res.* 1964, 16, 99; *Chem. Abstr.* 1965, 63, 8730 h); a saturated alcohol and pinitol separated from waxy material from leaves (*Sci. Res.* 1966, 3, 141; *Chem. Abstr.* 1967, 66, 83099 a).

NEW COMPOUNDS



Abrine



Hypaphorine

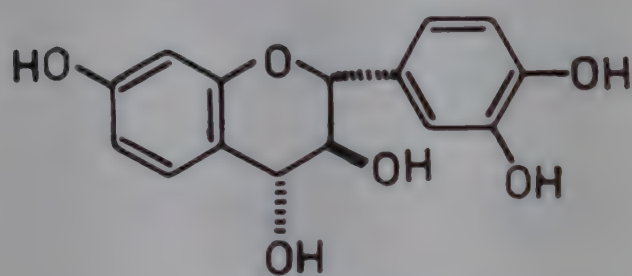
ACACIA (Mimosaceae)

A. arabica Willd.; see *A. nilotica* (L.) Willd. ex Delile ssp. *indica* (Benth.) Brenan

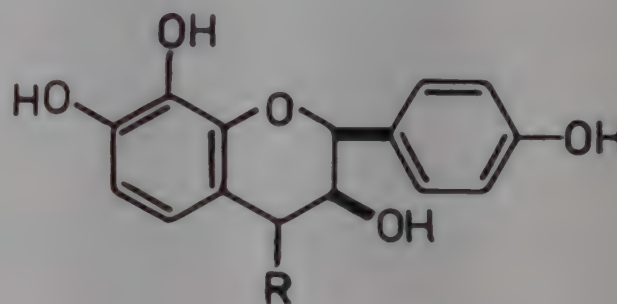
A. auriculiformis A. Cunn. ex Benth.

Heartwood contains a mixture of 3 isomeric flavan-3,4-diols - (-)tetracacidin, isotetracacidin and mollisacacidin - a dihydroflavonol, flavanone, flavonol and chalcone with 4',7,8- trihydroxy pattern (*Biochem. J.* 1966, 98, 493).

Distribution : Ornamental tree introduced from Australia and grown in gardens and on roadsides.

NEW COMPOUNDS

Mollisacacidin



Tetracacidin

R = β -OH

Isotetracacidin

R = α -OH

A. caesia W. & A.; see *A. torta* (Roxb.) Craib.

A. chundra (Roxb. ex Rottler) Willd. syn. *A. sundra* DC.

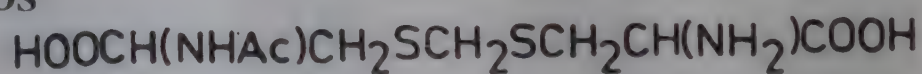
Mar.-Lal khair; Tel.-Sundra; Tam.-Karangali; Kan.-Kempujali, Kempukagli.

Autohydrolysis of purified gum removes rhamnose and arabinose residues (*Proc. Indian Acad. Sci.* 1959, 50A, 324; *Chem. Abstr.* 1960, 54, 22386 b); rhamnose, arabinose, galactose, traces of xylose and aldobiouronic acid from gum (*Agric. Univ. J. Res. Pt. I* 1962, 11, 237; *Chem. Abstr.* 1963, 58, 6911 f).

Distribution : Western and southern India, Gujarat, Rajasthan, Karnataka and Tamil Nadu.

A. farnesiana (L.) Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 2).

A novel amino acid - N-acetyl-L-djenkolic acid, mp. 170° - from seeds (*Phytochemistry* 1962, 1, 233).

NEW COMPOUNDS

N-acetyl-L-djenkolic acid

A. intsia W. & A.; see *A. torta* (Roxb.) Craib.

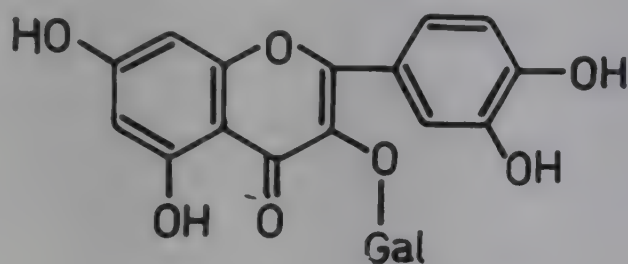
A. intsia Willd.; see *A. torta* (Roxb.) Craib.

A. melanoxylon R. Br.

Quercetin-3-galactoside (hyperin or hyperoside), mp. 227-30°, from flowers (*Naturwiss.* 1964, 51, 462; *Chem. Abstr.* 1965, 62, 1967 g); stigmast-7-enol and α -spinasterol from heartwood (*Aust. J. Chem.* 1967, 20, 1961):

Distribution : Introduced around 1840 in the Nilgiris and has become naturalised.

NEW COMPOUNDS



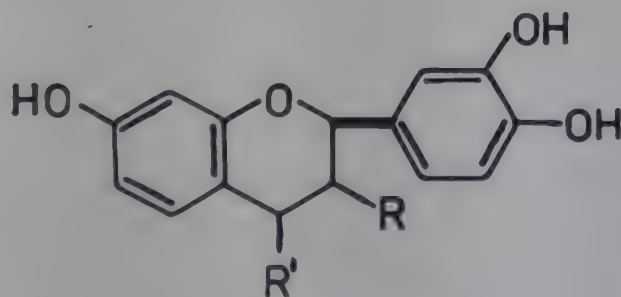
Quercetin-3-galactoside

A. mollissima Willd.

(-)-Robinetinidol [(-)-7,3',4',5'-tetrahydroxyflavan-3-ol], (+)catechin and (+)galocatechin from bark (*Biochem. J.* 1960, 74, 44); (+)fustin and fisetin from heartwood (*Biochem. J.* 1960, 76, 17; *ibid.* 1960, 77, 315) along with (-)fisetinidol, mp. 211°, leucofisetinidin and (+)mollisacacidin (*Biochem. J.* 1961, 78, 120).

Distribution : Introduced around 1840 in the Nilgiris, and in Travancore.

NEW COMPOUNDS



(-)Fisetinidol

R = α -OH, R' = H

Leucofisetinidin

R, R' = β -OH

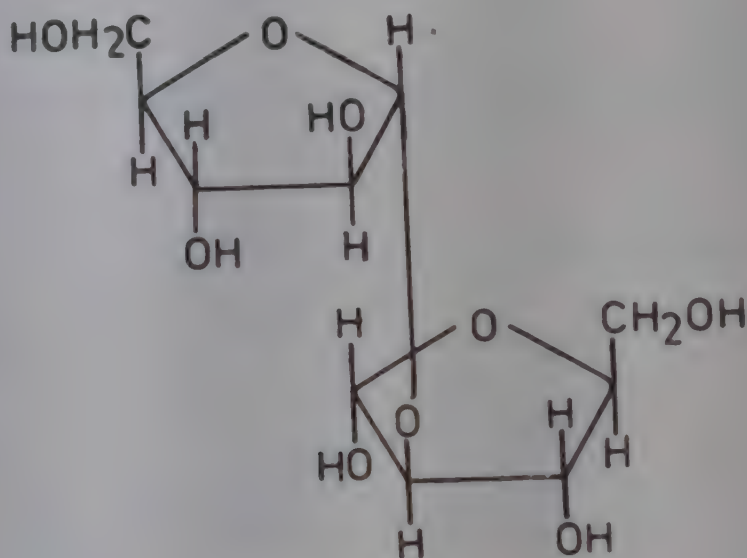
A. nilotica (L.) Willd. ex Delile ssp. *indica* (Benth.) Brenan syn. *A. arabica* auct. (non Willd.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 2).

The ethyl acetate-soluble fraction of plant extract exhibited toxicity to fungi comparable to that shown by condensed type tannins obtained from bark (*Indian J. Chem.* 1963, 1, 542).

A new arabinobiose - 2-O- β -L-arabinofuranosyl-L-arabinose - along with known 3-O- β -L-arabinopyranosyl-L-arabinose from gum (*Can. J. Chem.* 1968, 48, 2311); quercetin, gallic acid, (+)catechin, (-)epicatechin, (+)dicatechin, (+)leucocyanidin isolated (*Aust. J. Chem.* 1964, 17, 803); epigallocatechin, mp. 216°, from bark (*Indian J. Chem.* 1963, 1, 542); degraded gum composed of recurring units comprising ten galactose residues and four glucuronic acid

residues (*Proc. Indian Acad. Sci.* 1959, 50A, 374; *Chem. Abstr.* 1960, 54, 22386 b).

NEW COMPOUNDS



2-O-Arabinofuranosylarabinose

A. planifrons W. & A.

Tel.-Godugu thumma; Tam.-Kodaivelam.

d-Catechin from bark and heartwood (*Leather Sci.* 1965, 12, 162; *Chem. Abstr.* 1965, 63, 942).

Distribution : South Deccan (Salem, Madurai, Tinnevely and Travancore).

A. sundra DC.; see *A. chundra* (Roxb. ex Rottler) Willd.

A. torta (Roxb.) Craib. syn. *A. caesia* W. & A. (non Willd.); *A. intsia* W. & A., *A. intsia* Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 2).

An aliphatic hydroxy compound, mp. 104°, a waxy substance, mp. 76°, a triterpenoid, mp. 182° and stigmasterol from bark (*J. Sci. Ind. Res.* 1962, 21, 345); an amorphous substance from bark yielded acacinoic acid, mp. 280° and lupeol on hydrolysis (*Ann. Pharm. Fr.* 1959, 17, 442; *Chem. Abstr.* 1960, 54, 5015 h; *Arch. Pharm.* 1961, 294, 134; *Chem. Abstr.* 1961, 55, 12452 e).

ACALYPHA (Euphorbiaceae)

A. indica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 3).

Plant useful against pneumonia and asthma; sitosterol isolated (*J. Indian Chem. Soc.* 1967, 44, 792).

ACHILLEA (Asteraceae)

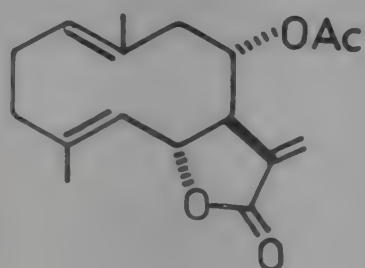
A. lanulosa Nutt.; see *A. millefolium* L.

A. millefolium L. syn. *A. lanulosa* Nutt. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 3).

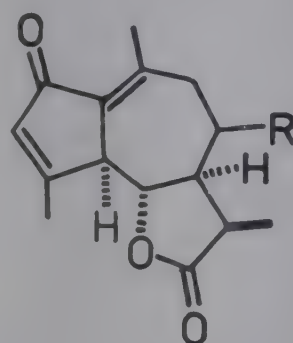
Luteolin-7-glucoside (*Magy. Kem. Foly.* 1964, 70, 392; *Chem. Abstr.* 1964, 61, 14769 c);

matricarin, deacetylmaticarin and two new sesquiterpene lactones - achillin, mp. 158° and 8-hydroxyachillin, mp. 161° (*Tetrahedron Lett.* 1963, 137; *Lloydia* 1967, 30, 144); betonicine, L-(-)-stachydrine, betaine, choline and base C, mp. 200° and S- and N- containing substance, mp. 266° , isolated (*Monatsh. Chem.* 1959, 90, 396; *Chem Abstr.* 1961, 55, 13465 f; *Arch. Pharm.* 1960, 293, 646; *Chem. Abstr.* 1960, 54, 23186 h); acetyl-balchanolide, mp. 125° , millefolide, mp. 138° and another lactone, mp. 138° , apart from α - and β - humulenes from flowers (*Collect. Czech. Chem. Commun.* 1961, 26, 1826, 1832); leukodin and achillin isolated (*Rev. Soc. Quim. Mex.* 1968, 12, 212; *Chem. Abstr.* 1969, 71, 3493 q).

NEW COMPOUNDS



Acetyl-balchanolide

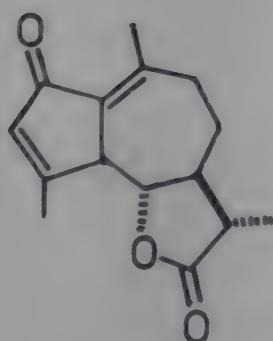


Achillin

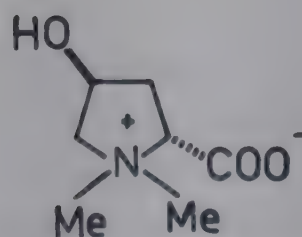
R = H, H

8-Hydroxyachillin

R = H, OH



Leukodin



Betonicine

ACHYRANTHES (Amaranthaceae)

A. aspera L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 4).

Betaine, mp. 292° isolated (*Indian J. Chem.* 1966, 4, 461).

ACOKANTHERA (Apocynaceae)

A. spectabilis Hook.f.

Friedelin from leaves (*Llyodia* 1964, 27, 253); a new cardenolide glycoside - acospectoside A, mp. 290° isolated (*J. Pharm. Sci.* 1965, 54, 1834).

BIOLOGICAL ACTIVITY

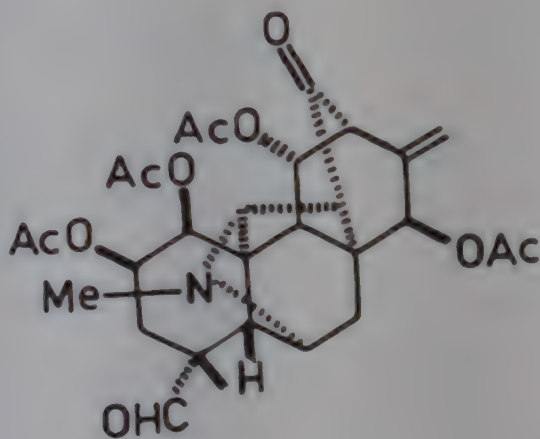
Lethal dose of acospectoside A in cats 1.806 mg/kg. It showed weak cardiac activity (*J. Pharm. Sci.* 1965, 54, 1834).

Distribution : Introduced into Indian gardens.

ACONITUM (Ranunculaceae)

A. bisma (Buch.-Ham.) Rap. syn. *A. palmatum* D. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 5).

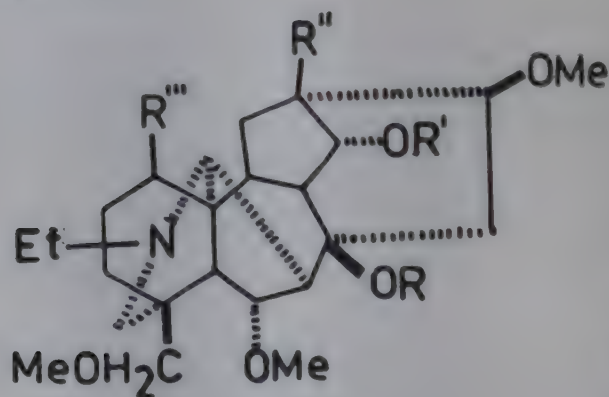
Five diterpene alkaloids - vakognavine, mp. 298°, palmatisine, mp. 285°, vakatisine, mp. 306°, vakatisinine, mp. 308° and vakatidine, mp. 259° - from roots (*J. Indian Chem. Soc.* 1965, 42, 49; *Tetrahedron Lett.* 1968, 2119); absolute configuration of vakognavine (*J. Am. Chem. Soc.* 1971, 93, 5942; *Indian J. Chem.* 1974, 12, 1219).

NEW COMPOUNDS

Vakognavine

A. chasmanthum Holmes ex Stapf (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 4).

An alkaloid - chasmanine - isolated (*Can. J. Chem.* 1965, 43, 825); indaconitine and new alkaloids - base A, base B, chasmaconitine and chasmanthinine - from roots (*Can. J. Chem.* 1964, 42, 154).

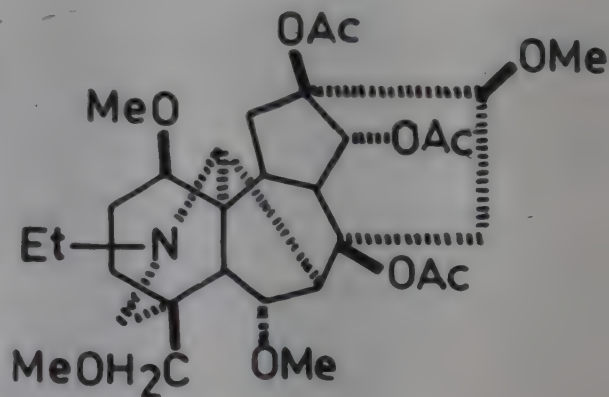
NEW COMPOUNDS

Chasmanine

$R, R', R'' = H, R''' = \alpha\text{-OMe}$

Chasmanthinine

$R = \text{Ac}, R' = \text{Bz}, R'' = \text{OH}, R''' = \beta\text{-OMe}$



Chasmaconitine

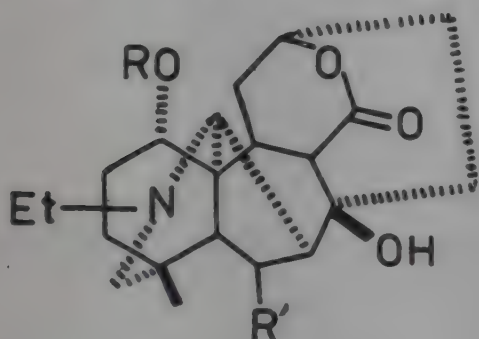
A. falconeri Stapf (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 4).

Bishatisine, mp. 295° , and bishaconitine, mp. 118° , from roots (*Indian J. Chem.* 1966, 4, 39).

A. heterophyllum Wall. ex Royle (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 4).

Structure and absolute stereochemistry of atisine (*Can. J. Chem.* 1962, 40, 896); chemical studies on hetisine (*J. Org. Chem.* 1962, 27, 2782); structure of heteratisine proposed (*Tetrahedron Lett.* 1964, 669); heterophyllisine, mp. 178° , heterophylline, mp. 221° , heterophyllidine, mp. 269° , hetidine, a new atidine and hetisinone from roots (*Phytochemistry* 1968, 7, 625; *Tetrahedron Lett.* 1967, 557; *Can. J. Chem.* 1968, 46, 2635).

NEW COMPOUNDS



Heterophyllisine

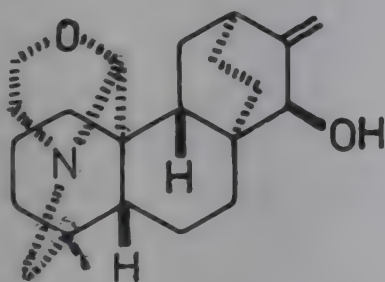
R = Me, R' = H

Heterophylline

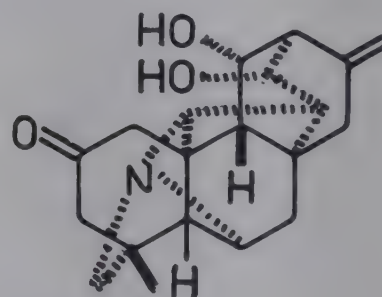
R, R' = H

Heterophyllidine

R = H, R' = β -OH



Atisine

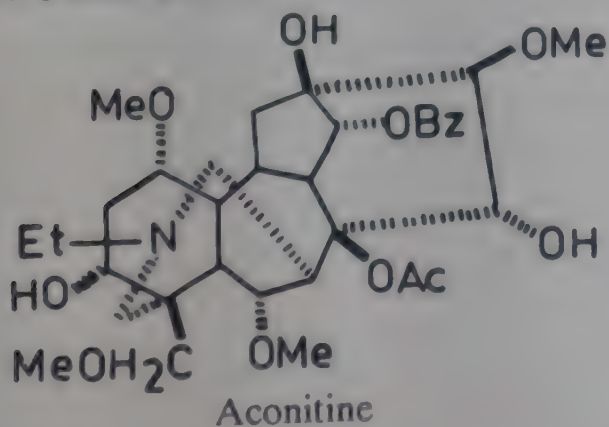


Hetisinone

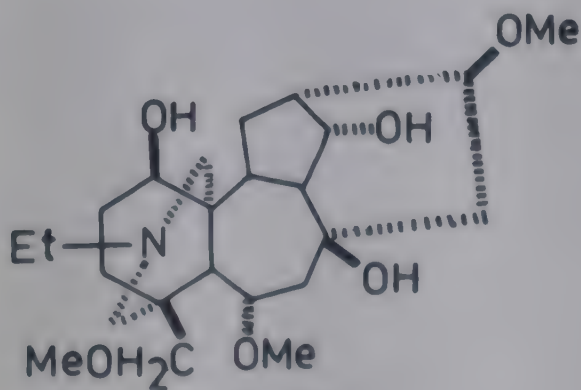
A. napellus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 5).

Neoline, mp. 160° , isolated (*Tetrahedron Lett.* 1960, 17); structure of aconitine established (*Collect. Czech. Chem. Commun.* 1963, 28, 2462; *Tetrahedron Lett.* 1971, 867; *J. Am. Chem. Soc.* 1976, 98, 2626); absolute configuration of neoline (*J. Am. Chem. Soc.* 1974, 96, 7817; *ibid.* 1976, 98, 2617).

NEW COMPOUNDS



Aconitine



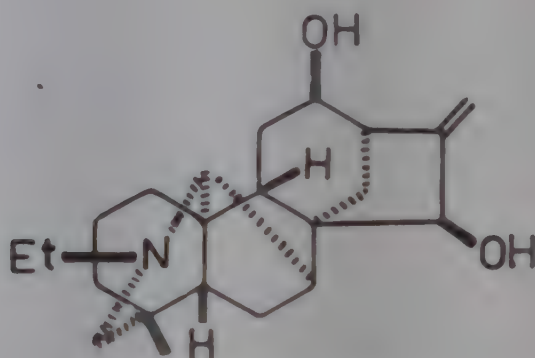
Neoline

A. palmatum D. Don; see *A. bisma* (Buch.-Ham.) Rap.

A. soongaricum Stapf (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 5).

Aconitine, songorine, napellonine and a base, mp. 159°, from roots; songorine and a base, mp. 284°, from aerial parts (*Dokl. Akad. Nauk Uz. SSR* 1965, 22, 21; *Chem. Abstr.* 1965, 63, 12000 f); crystal structure of songorine (*Chem. Pharm. Bull.* 1965, 13, 1270).

NEW COMPOUNDS



Songorine

A. spicatum (Bruhl) Stapf (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 5).

Two major alkaloids - pseudaconitine and bishaconitine - identified (*Can. J. Chem.* 1963, 41, 3055).

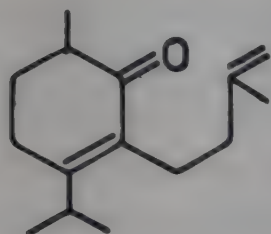
ACORUS (Araceae)

A. calamus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 5).

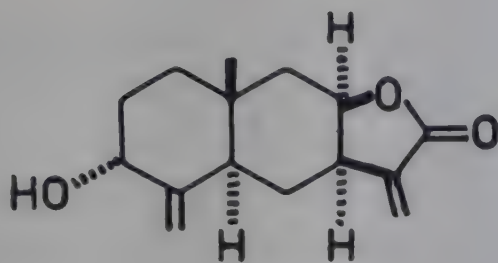
Essential oil showed spasmolytic activity in animals which was approximately 10% of that of papaverine (*Acta Pol. Pharm.* 1966, 23, 477; *Chem. Abstr.* 1967, 66, 93653 r).

Structure of calacone from oil confirmed by synthesis (*Collect. Czech. Chem. Commun.* 1961, 26, 1343); structure of telekin and isotelekin established by chemical degradations (*Collect. Czech. Chem. Commun.* 1961, 26, 1343; *J. Am. Chem. Soc.* 1966, 88, 3408); calarene was shown by GLC to contain 9-aristolene (25%) and β -gurjunene (10-aristolene) (75%) (*Tetrahedron Lett.* 1962, 827; *Collect. Czech. Chem. Commun.* 1964, 29, 795); asarone estimated in oil by chromatography (*J. Chromatog.* 1965, 17, 195); monocyclic ketones - shyobunone, epishyobunone and isoshyobunone - from essential oil of rhizome (*Tetrahedron Lett.* 1968, 5315).

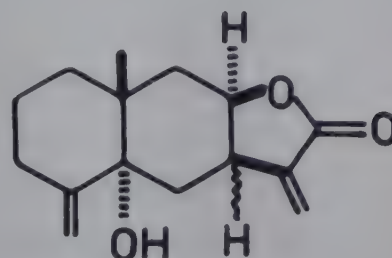
NEW COMPOUNDS



Calacone



Telekin



Isotelekin

BIOLOGICAL ACTIVITY

Asarone and β -asarone prolonged hypnotic activity of anaesthetic agents, caused fall in rectal temperature and stoppage of heart in diastole (frog) and showed anticholinergic action (*Nature* 1961, 192, 1299). Both prolonged hypnosis due to pentobarbital and ethanol in mice; LSD₂₅ and iproniazid failed to influence this hypnotic potentiating property. They caused significant reduction in rectal temperature of mice and showed no analgesic activity (*Indian J. Med. Res.* 1962, 50, 46). Both asarone and β -asarone showed cardiac depressant activity, moderate hypotensive action in anaesthetised dogs and antiacetylcholine activity. Acute toxicity studies in rats revealed that near toxic doses of asarone caused ataxia, hypnosis and loss of righting reflex, whereas β -asarone failed to induce any of these responses (*Indian J. Med. Res.* 1962, 50, 61).

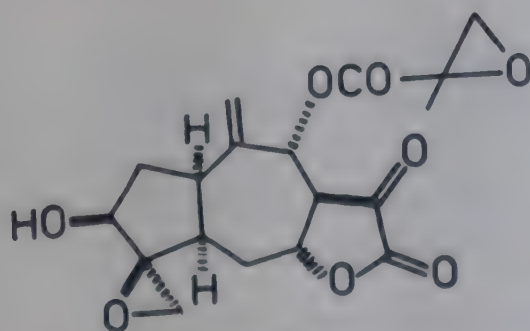
Asarone did not produce any change in noradrenaline content of whole brain of rats. Its sedative effect is due to depression of the ergotropic division of the hypothalamus (*J. Pharm. Pharmacol.* 1967, 19, 170).

ACROPTILON (Asteraceae)

A. repens (L.) DC. syn. *Centaurea picris* Pall. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 58).

Two new sesquiterpene lactones - repin, mp. 154°, and acroptilin, mp. 196° - isolated from leaves and flowers (*Khim. Prir. Soedin.* 1966, 2, 290; *Chem. Abstr.* 1967, 66, 486 w; *Khim. Prir. Soedin.* 1967, 3, 284; *Chem. Abstr.* 1968, 68, 3005 v; *J. Chem. Soc. Perkin I* 1976, 1663).

NEW COMPOUNDS



Repin

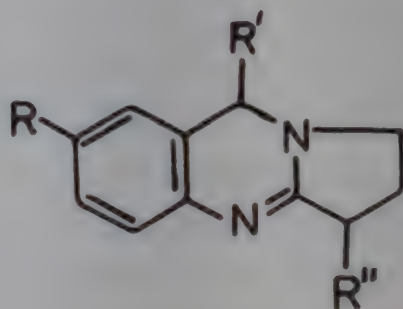
ADHATODA (Acanthaceae)

A. vasica Nees; see *A. zeylanica* Medik.

A. zeylanica Medik. syn. *A. vasica* Nees (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 7).

An alkaloid - vasicinone - from leaves characterised as 2,3-(α -hydroxytrimethylene)-4-quinazolone (*Nature* 1959, 184, 1317; India 64,603 (1960) April 20; *Chem. Abstr.* 1960, 54, 20096 f; *J. Org. Chem.* 1963, 28, 445); vasicine, β -sitosterol, tritriacontane and vasicinine (*Pakistan J. Sci. Ind. Res.* 1967, 10, 224; *Chem. Abstr.* 1968, 69, 6807 d); vasicinol, mp. 260°, identical with 6-hydroxypeganine (*Indian J. Chem.* 1965, 3, 524); 6-hydroxypeganine isolated from leaves and structure confirmed by synthesis (*Monatsh. Chem.* 1960, 91, 1150, 1151; *Chem. Abstr.* 1961, 55, 14492 g; 14492 h); mass spectra of vasicine and vasicinol and its methyl ether studied (*Indian J. Chem.* 1966, 4, 291); a new alkaloid - vasicinine, mp. 208° - from young inflorescences (*Pakistan J. Sci. Ind. Res.* 1965, 8, 76; *Chem. Abstr.* 1966, 64, 9721 d).

NEW COMPOUNDS



6-Hydroxypeganine

$R, R'' = OH, R' = H, H$

Vasicinone

$R = H, R' = O, R'' = \beta-OH$

Vasicine

$R = H, R' = H, H; R'' = \beta-OH$

BIOLOGICAL ACTIVITY

Relaxation producing activity of dl-vasicinone on isolated guinea pig tracheal muscle was about 1/2000 that of adrenaline. l-Vasicine caused slight relaxation at low concentration but contraction at higher concentration. Compared to adrenaline, dl-vasicinone was 1/3800 as active against histamine - induced contraction (*Nature* 1962, 196, 1217).

ADIANTUM (Adiantaceae)

A. aethiopicum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 7).

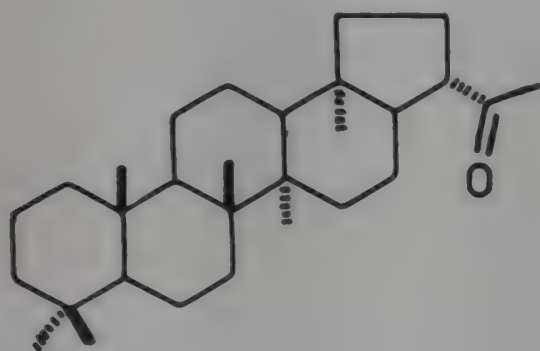
Astragalin (kaempferol-3-glucoside), prunin and isoquercetin isolated from plant (*Shokubutsugaku Zasshi* 1968, 81, 469; *Chem. Abstr.* 1969, 70, 44848 g).

A. capillus-veneris L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 7).

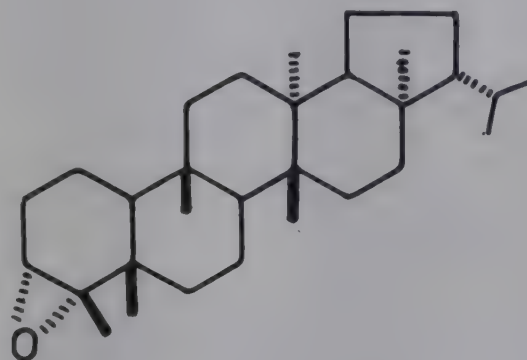
Mixture of esters, ketone, mp. 222°, a diol, mp. 243° (*Ricerca Sci.* 1960, 30, 2146; *Chem. Abstr.* 1961, 55, 24933 f); a nortriterpene - adiantone (*Tetrahedron Lett.* 1963, 1283); a

triterpene epoxide - adiantoxide, mp. 229° - isolated and characterised as 3 α ,4 α -epoxyfilicane (*Tetrahedron Lett.* 1964, 1; *Tetrahedron* 1969, 25, 2939); astragalin, isoquercitrin, nicotiflorin, kaempferol-3-glucuronide, rutin and querciturone isolated (*Shokubutsugaku Zasshi*, 1969, 82, 294; *Chem. Abstr.* 1969, 71, 120515 j).

NEW COMPOUNDS



Adiantone

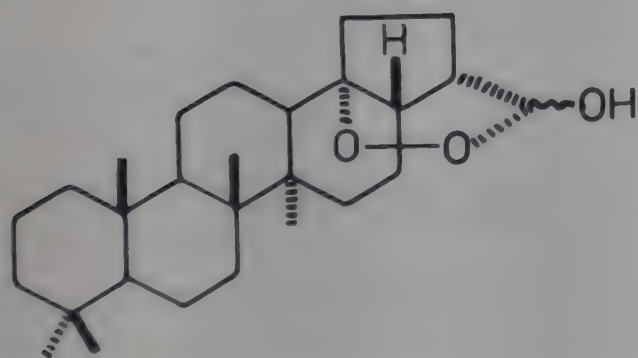


Adiantoxide

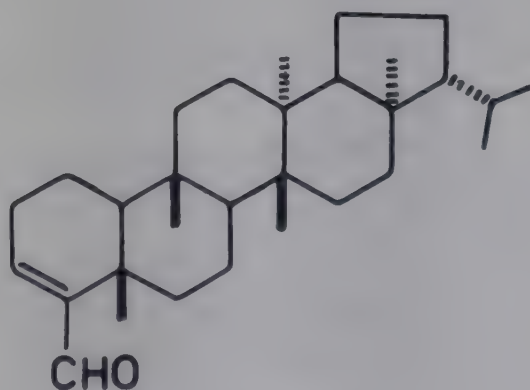
A. pedatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 7).

Isofernene (8-fernene), mp. 191°, fernene, mp. 171°, 7-fernene, mp. 211°, 3-filicene, mp. 224°, adiantone, mp. 220°, a nortriterpenoid hemiketal - adipedatol, mp. 185° - and filicenol from leaves (*Tetrahedron Lett.* 1966, 6069).

NEW COMPOUNDS



Adipedatol

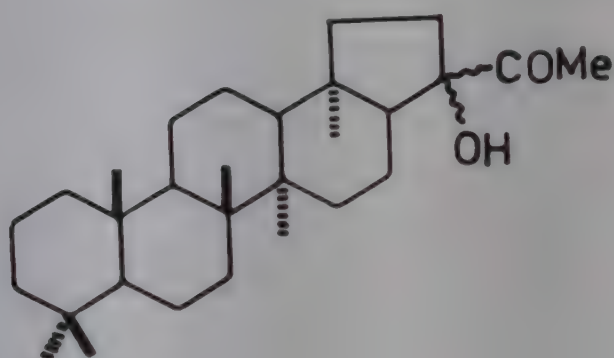


Filicenol

A. venustum D. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 7).

Adiantone, traces of 3-filicene and a new ketol - 21-hydroxy-30- norhopan-22-one (I)-isolated (*Tetrahedron Lett.* 1966, 3943); along with a triterpenoid keto-alcohol, α -carotene monoepoxide, leucopelargonidin, kaempferol and quercetin glucosides (*Curr. Sci.* 1967, 36, 88).

NEW COMPOUNDS



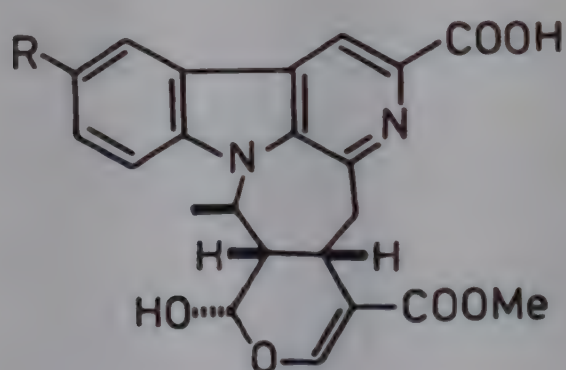
I

ADINA (Rubiaceae)

A. cordifolia (Willd. ex Roxb.) Benth. & Hook. f. ex Brandis (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 7).

An indole alkaloid - cordifoline - isolated as pentaacetate (*Chem. Commun.* 1967, 453); adifoline, mp. 350°, from heartwood (*Chem. Commun.* 1968, 350); 10-deoxyadifoline and 10-deoxycordifoline from heartwood (*Gazz. Chim. Ital.* 1968, 98, 974; *Chem. Abstr.* 1969, 70, 37964 p).

NEW COMPOUNDS

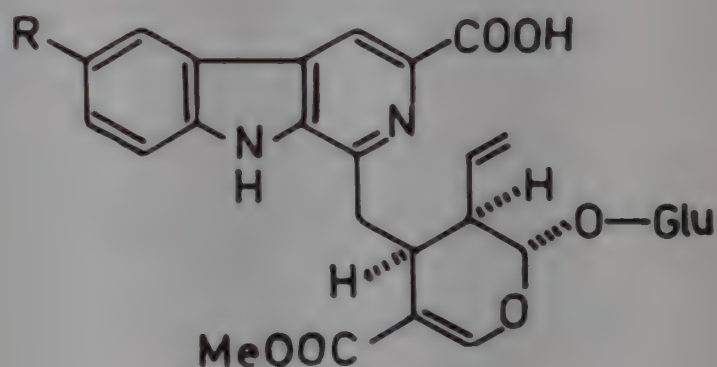


Adifoline

R = OH

10-Deoxyadifoline

R = H



Cordifoline

R = OH

10-Deoxycordifoline

R = H

ADONIS (Ranunculaceae)

A. chrysocyathus Hook. f. & Thoms. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 8).

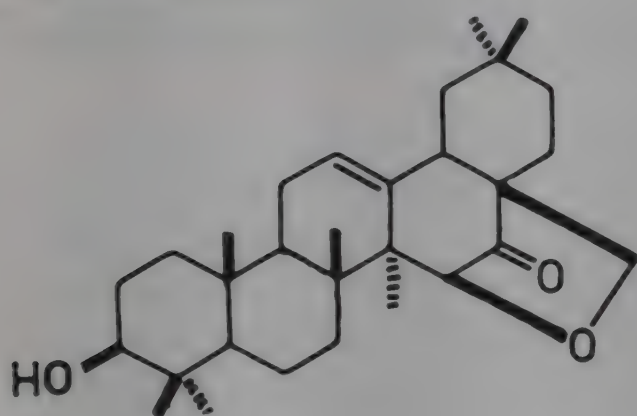
Cymarine and k-strophanthin-β, mp. 195°, from roots (*Zh. Obshch. Khim.* 1961, 31, 2424, *Chem. Abstr.* 1962, 56, 2717 i).

AEGICERAS (Myrsinaceae)

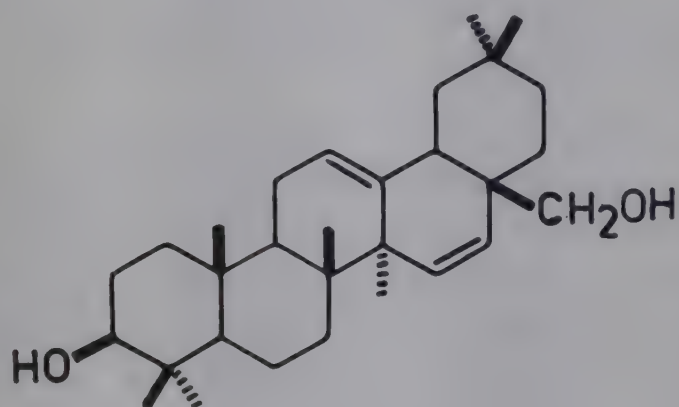
A. corniculata (L.) Blanco syn. *A. majus* Gaertn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 8).

α -Spinasterol, stigmasterol, syringic acid and a new triterpene - aegicerin, mp. 254° - isolated (*Ann. Biochem. Exp. Med.* 1961, 21, 354; *Chem. Abstr.* 1962, 51, 16670 g); aegicerin characterised as 3 β -hydroxy-15 β ,28-epoxy-16-oxo-olean-12-ene (*Chem. Ind.* 1963, 1523; *Tetrahedron*, 1964, 20, 973); 28-norolean-12,17-diene- 3 β -ol, mp. 170°, from bark (*J. Org. Chem.* 1962, 27, 1470); genin A, mp. 230°, aegiceradienol, mp. 185°, aegiceradiol, mp. 220°, from bark (*Tetrahedron* 1962, 18, 461); along with rapanone and genin A (*Tetrahedron Lett.* 1965, 4639); structure of aegiceradiol established as 3 β ,28-dihydroxy-olean-12,15-diene (*Tetrahedron* 1962, 18, 461).

NEW COMPOUNDS



Aegicerin



Aegiceradiol

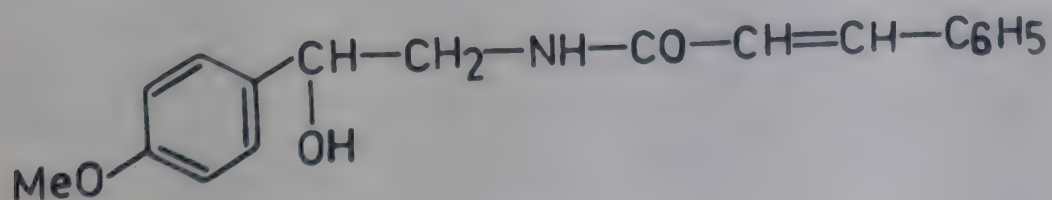
A. majus Gaertn.; see *A. corniculata* (L.) Blanco

AEGLE (Rutaceae)

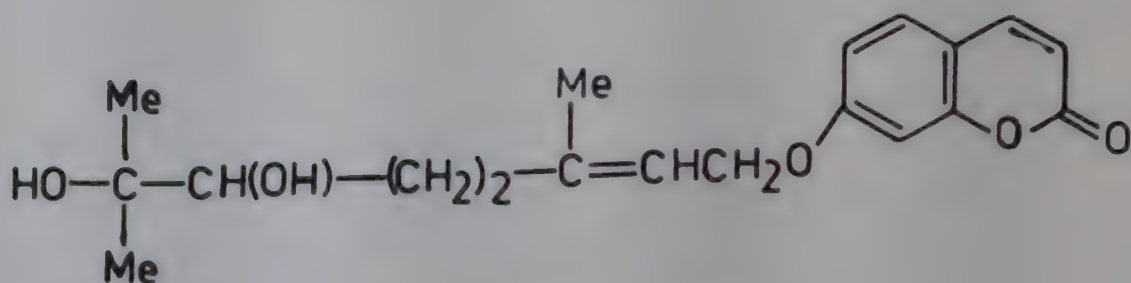
A. marmelos (L.) Correa (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 8).

Umbelliferone, skimmianine, a new coumarin - marmin, mp. 123° - β -sitosterol, lupeol and γ -sitosterol from immature bark and roots (*J. Chem. Soc.* 1959, 1922; *J. Indian Chem. Soc.* 1960, 37, 334; *Tetrahedron Lett.*, 1967, 471; *Indian J. Appl. Chem.* 1961, 24, 55); γ -sitosterol from leaves (*Indian J. Appl. Chem.* 1961, 24, 55); a phenolic alkaloid characterised as 1-phenyl-7-hydroxytetrahydroquinazolin-4-one from roots (*Sci. Cult.* 1967, 33, 279); aegeline, mp. 176°, identified as N- β -hydroxy-p-methoxyphenylethylcinnamide from leaves (*J. Org. Chem.* 1959, 24, 687).

NEW COMPOUNDS



Aegeline

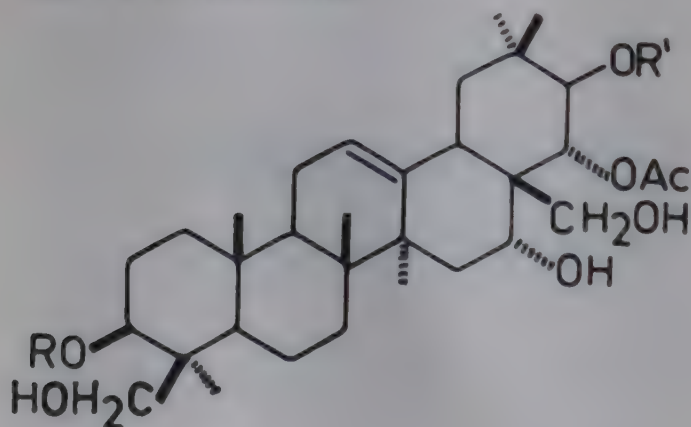


Marmin

AESCULUS (Hippocastanaceae)

A. hippocastanum L. (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 8).

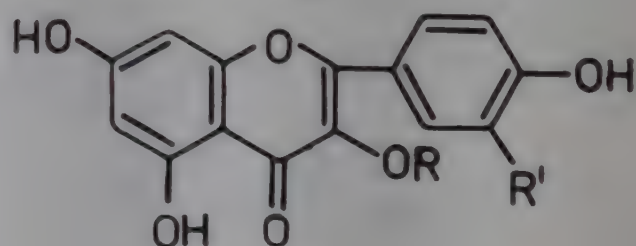
Escin, mp. 224°, from seeds (*Ann. Chem.* 1963, 669, 171; *Acta Pharm. Jugoslav.* 1966, 16, 111; *Chem. Abstr.* 1967, 66, 118800 b; *Tr. Leningr. Khim.-Farmatsevt. Inst.* 1960, 12, 263; *Chem. Abstr.* 1962, 57, 2331 e); quercetin-3-xylosidoglucoside, mp. 198°, kaempferol-3-diglycoside, mp. 203°, quercetin-3-glucosidorhamnoside, mp. 206°, kaempferol-3-xylosidoglucoside, mp. 189°, kaempferol-3-glucosidorhamnoside, mp. 186°, quercetin-3-glucoside, mp. 177° and quercetin-3-diglucoside, mp. 205° (*Arzneim. Forsch.* 1967, 17, 546); quercetin-3,4-diglucoside from seeds (*Naturwiss.* 1961, 48, 54; *Chem. Abstr.*, 1961, 55, 14445 h); new glycosides - kaempferol-3- α -L-arabinofuranoside, mp. 228°, kaempferol-3- α -L-rhamnofuranoside, mp. 173° (*Zh. Obshch. Khim.* 1964, 34, 4128; *Chem. Abstr.* 1965, 62, 10503 d); avicularin and quercetin-3- α -L-rhamnofuranoside, mp. 177°, isolated and their structures elucidated (*Dokl. Akad. Nauk SSSR* 1966, 169, 126; *Chem. Abstr.* 1966, 65, 17038 h); castaprenol-11, castaprenol-12 and castaprenol-13 from leaves (*Biochem. J.* 1966, 102, 313); enzymatic hydrolysis of pure saponin yielded mixture of genins whose main constituent identified as protoaescigenin-21-tiglate-22-acetate (*Angew. Chem. Int. Ed. Engl.* 1968, 7, 547; *Chem. Abstr.* 1968, 69, 59441 x); escin found to be mixture of α - and β -escins which on hydrolysis gave glucuronic acid, glucose (1:2) and protoaescigenin-22-acetate acylated by either angelic or tiglic acid at C-21 (*Tetrahedron* 1969, 25, 415); O- β -D-fructofuranosyl-(2 \rightarrow 6)- β -D-fructofuranosyl- α -D-glucopyranoside, mp. 143°, from seeds (*Carbohydr. Res.* 1969, 10, 586).

NEW COMPOUNDS

Escin

R = Gluc. acid(2 \rightarrow 1)Glu(4 \rightarrow 1)Glu

R' = Tigloyl/Angeloyl



Kaempferol 3 α -L-arabinofuranoside

R = Ara, R' = H

Quercetin-3 α -L-rhamnofuranoside

R = Rha, R' = OH

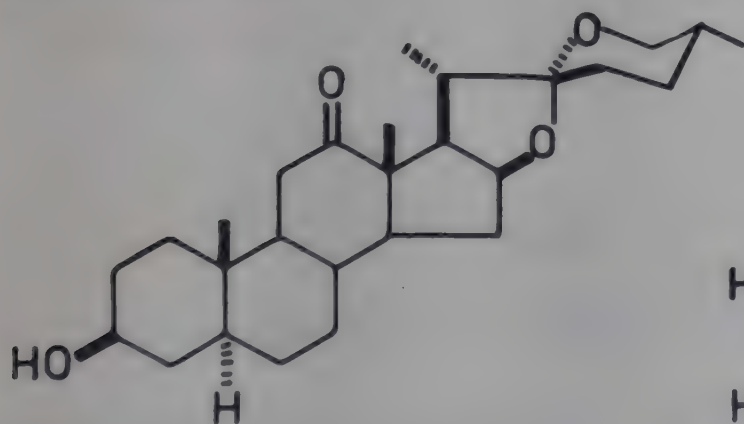
BIOLOGICAL ACTIVITY

The MLD of escin in frogs (lymph node), mice, rats (subcutaneous) and rabbits (i.v.) was 1.0, 0.5, 0.75, and 0.02 g/kg respectively. In subtoxic doses it accelerated respiration, acted as hypotensive and cardiac stimulant. (*Farmakol. Toksikol.* 1960, 23, 51; *Chem. Abstr.* 1961, 55, 2922 d); escin caused inhibition of oedema and reduction of vascular fragility in anaphylactoid ovalbumin edema and in the petechial reaction of rats (*Arzneim. Forsch.* 1960, 10, 263); i.v. and oral LD₅₀ in rat (mg/kg) of saponin was 16.8 and 50 respectively (*Arzneim. Forsch.* 1962, 12, 815); permeability of skin capillaries as determined by the trypan blue method, was not influenced significantly by proaescigenin; escin, however, showed a striking effect (*Acta Pharm. Hung.* 1964, 34, 79; *Chem. Abstr.* 1964, 61, 6221 a).

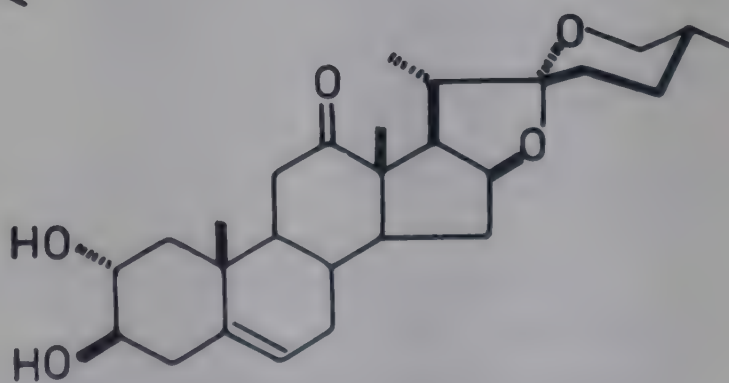
AGAVE (Agavaceae)

A. americana L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 9).

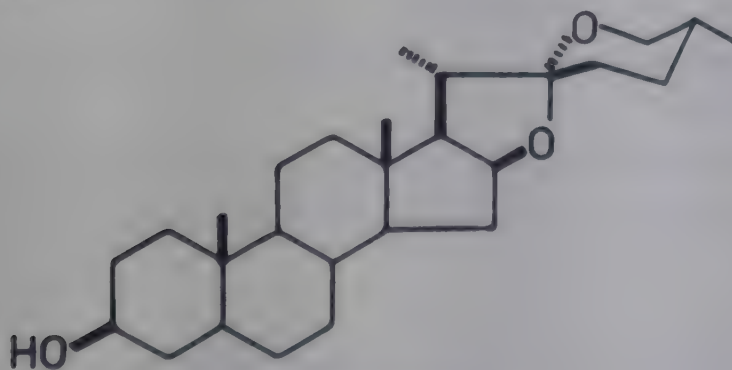
Steroid saponogenins - hecogenin, 5 α ,25D-spirostan-3 β -ol-12-one (0.17%), chlorogenin, 5 α ,25D-spirostan-3 β , 6 α -diol (0.13%) and two other compounds, mp. 259° and 273°, isolated (*J. Chem. U.A.R.* 1960, 3, 165; *Chem. Abstr.* 1961, 55, 11461 h); seeds yielded neotigogenin, kammogenin along with hecogenin (*Yao Hsueh Hsueh Pao* 1965, 12, 392; *Chem. Abstr.* 1966, 65, 11553 f).

NEW COMPOUNDS

Hecogenin



Kammogenin



Neotigogenin

A. cantala (Haw.) Roxb.

S. - Kantala

Presence of hecogenin (0.15%) along with diosgenin (0.03%) (*Bull. Calcutta Sch. Trop. Med.* 1959, 7, 5; *Chem. Abstr.* 1960, 54, 13555 c).

Distribution : Introduced into India and naturalised in east and west coasts, upper Gangetic plains and Punjab; planted as hedge.

A. sisalana Perr. ex Engelm.

Eng.- Sisal

5 α -Pregn-16-en-3 β -ol-20-one, mp. 202°, and tigogenin acetate (US 3,303,187 (1967) Feb. 7; *Chem. Abstr.* 1967, 66, 105122 g).

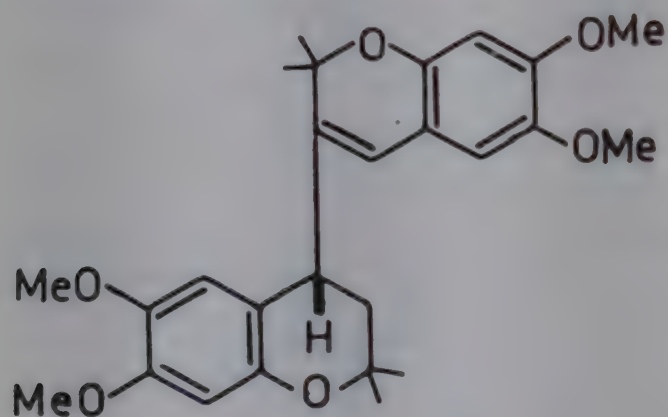
Distribution : Cultivated in Assam, Bengal, Maharashtra and south India.

AGERATUM (Asteraceae)

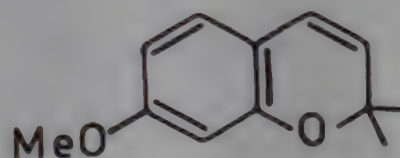
A. conyzoides L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 9).

6-Demethoxyageratochromene, bp. 142° and dimer of ageratochromene, mp. 154°, obtained as mixture from essential oil (*Tetrahedron Lett.* 1967, 2573).

NEW COMPOUNDS



Ageratochromene Dimer



6-Demethoxyageratochromene

A. houstonianum Mill.

Ageratochromene from essential oil; its structure established, along with 7-methoxy-2,2-dimethyl-3-chromene, by chemical degradation and synthesis (*Acta Polytech. Scand. Ser.* 1961, 13, 1; *Chem. Abstr.* 1962, 57, 16619 b).

Distribution : Throughout India in plains, ascending up to 1500 m. in hills.

BIOLOGICAL ACTIVITY

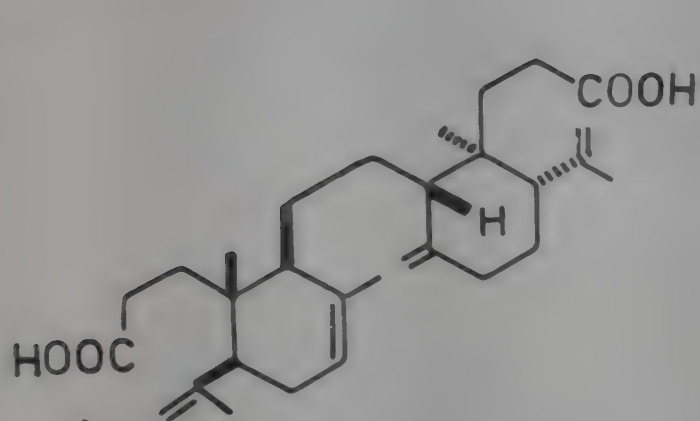
Ageratochromene showed antiallotropin (induction of premature ecdysis in insects) activity (*Acta Polytech. Scand. Ser.* 1961, 13, 1; *Chem. Abstr.* 1962, 57, 16619 b).

AGLAIA (Meliaceae)

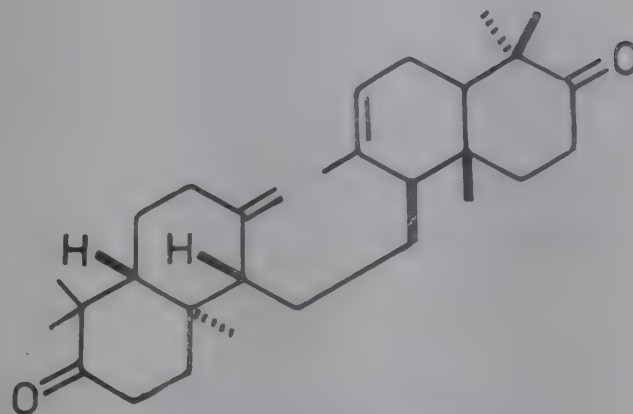
A. domestica (Correa emend. Jack) Pellegrin syn. *Lansium domesticum* Jack (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 149).

Isolation and structures of lansic acid, mp. 182° and its minor congener - α -onoceradien-dione - from peel (*Tetrahedron Lett.* 1967, 3571; *ibid.* 1968, 3731).

NEW COMPOUNDS



Lansic acid

 α -Onoceradiendione

A. odorata Lour. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 9).

Aqueous extract of leaves used as heart stimulant and febrifuge.

Aglaiol, mp. 113°, from leaves (*Tetrahedron* 1965, 21, 917).

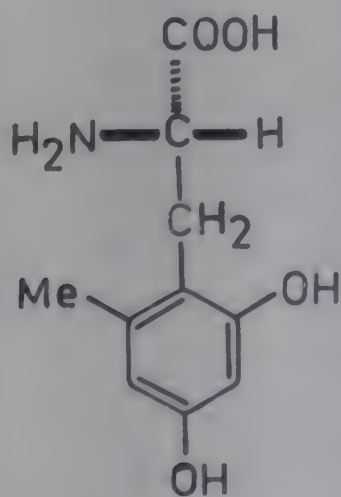
AGROSTEMMA (Caryophyllaceae)

A. githago L. syn. *Lychnis githago* (L.) Scop.

A new amino acid - orcylalanine - identified as 2,4-dihydroxy-6-methylphenylalanine from seeds (*Biochem. Z.* 1958, 330, 428; *Chem. Abstr.* 1961, 55, 17770 d); orcylalanine distributed throughout the plant (*Physiol. Plant* 1961, 14, 638; *Chem. Abstr.* 1962, 57, 11656 c).

Distribution : Native of Europe, introduced into India. A pernicious weed in wheat fields.

NEW COMPOUNDS



Orcylalanine

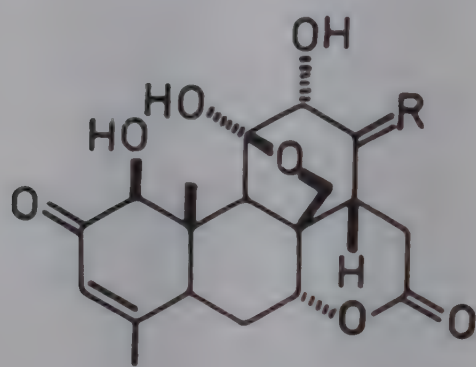
AILANTHUS (Simaroubaceae)

A. altissima (Mill.) Swingle syn. *A. glandulosa* Desf. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 9).

Three bitters - 2,6-dimethoxyquinone, aiantone, mp. 222° and an unidentified compound,

mp. 263° - isolated (*Atti. Accad. Nazl. Lincei Rend. Cl. Sci. Fis. Mat. Nat.* 1963, 35, 348; *Chem. Abstr.* 1964, 61, 10719 a); four compounds - chaparrinone, mp. 238°, ailanthone, mp. 234°, and two substance, mp. 155° and 259° - from seeds (*Tetrahedron Lett.* 1964, 3983; *Bull. Soc. Chim. Fr.* 1964, 2016); fatty acids (27%) from bark appear to be C22 acids (*Riv. Ital. Sostanze Grasse* 1965, 42, 485; *Chem. Abstr.* 1965, 63, 15224 e); bitter substances I, mp. 253° and II, mp. 264°, from bark (*Tetrahedron Lett.* 1965, 2273).

NEW COMPOUNDS

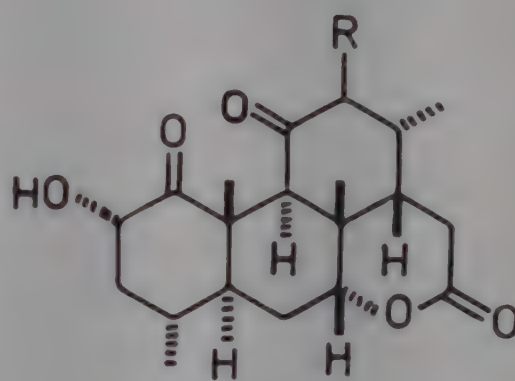


Ailanthone

R = CH₂

Chaparrinone

R = α-Me,H



I

R = OH

II

R = β-OAc

A. excelsa Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 10).

Malanthine (0.09%), mp. 153° and another compound, mp. 215°, from bark (*Indian J. Chem.* 1964, 2, 40).

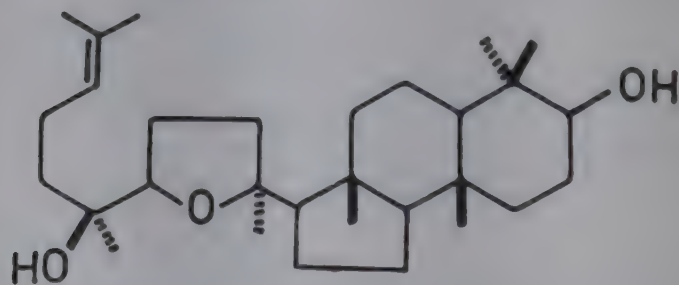
A. glandulosa Desf.; see *A. altissima* (Mill.) Swingle

A. malabarica DC.; see *A. triphysa* (Dennst.) Alston

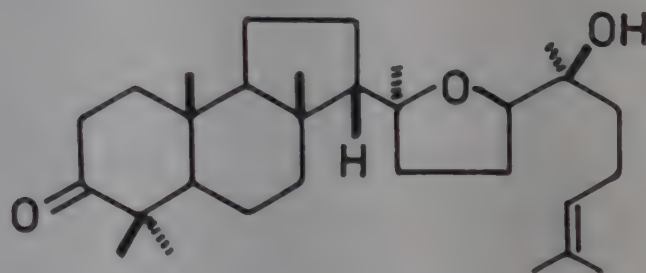
A. triphysa (Dennst.) Alston syn. *A. malabarica* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 10).

New triterpenoids - malabaricol, mp. 68°, epoxymalabaricol, mp. 143°, and malabaricanediol - isolated from trunk exudate (*Tetrahedron Lett.* 1967, 4837).

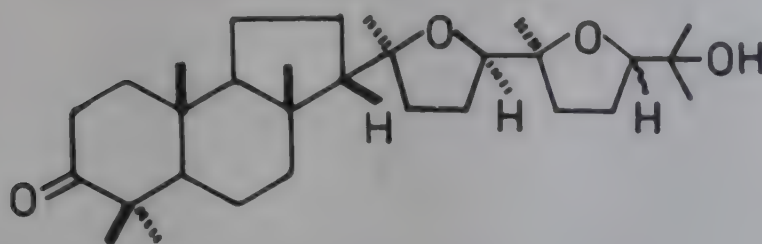
NEW COMPOUNDS



Malabaricanediol



Malabaricol



Epoxymalabaricol

AJUGA (Lamiaceae)

A. bracteosa Wall. ex Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 10).

Ceryl alcohol, β -sitosterol, γ -sitosterol and another compound, mp. 94° , from nonsaponifiable fraction; cerotic, palmitic, oleic and linoleic acids from saponifiable fraction; glucose, arabinose and phenolic, acidic and neutral bitter components present in alcoholic extract of plant (*J. Sci. Ind. Res.* 1961, 20B, 185).

ALANGIUM (Alangiaceae)

A. lamarckii Thwaites; see *A. salvifolium* (L.f.) Wang

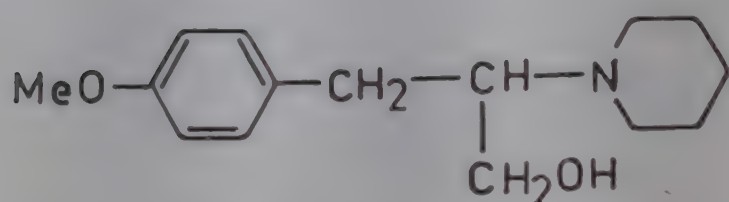
A. salvifolium (L.f.) Wang syn. *A. lamarckii* Thwaites (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 10).

Total alkaloidal fraction from leaves had no significant action on isolated rectal muscles. It had negative inotropic action on frog heart in high doses. It inhibited cholinesterase of dog trachea. The alkaloids showed antispasmodic, hypotensive, anticholinesterase and adrenolytic activities (*Indian J. Med. Res.* 1960, 48, 8).

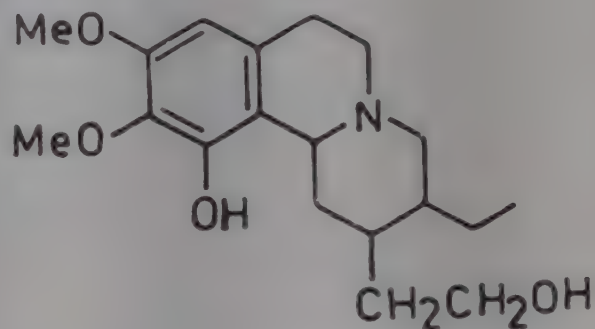
An alkaloid - alangine A, mp. 85° (*J. Sci. Ind. Res.* 1960, 19B, 8); two new alkaloids - marckine and marckidine - from root bark (*Pakistan J. Sci. Ind. Res.* 1965, 8, 161; *Chem. Abstr.* 1968, 68, 899 d); tubulosine, mp. 257° , cephaeline, mp. 102° , from root bark (*Lloydia* 1965, 28, 212); emetine, cephaeline and psychotrine, mp. 121° , from stem and root bark (*Curr. Sci.* 1966, 35, 486; *Indian J. Chem.* 1964, 2, 379; *Tetrahedron* 1964, 20, 399); in addition to tubulosine, a new C-3' stereoisomer - isotubulosine, mp. 198° - isolated from roots (*Tetrahedron Lett.* 1966, 1081, 5077); lamarckinine, mp. 265° , from bark (*Pakistan J. Biol. Agric. Sci.* 1965, 8, 211; *Chem. Abstr.* 1966, 64, 9782 f); N-methylcephaeline and deoxytubulosine from barks of root and stem (*Curr. Sci.* 1966, 35, 281; *Chem. Commun.* 1965, 315; *Tetrahedron* 1964, 20, 399); psychotrine, alangicine and demethylpsychotrine from root bark (*Tetrahedron Lett.* 1967, 2143); a new phenolic alkaloid - ankorine, mp. 174° (*J. Pharm. Sci.* 1965, 54, 481); campesterol, episterol and two unidentified triterpenoids (*Experientia* 1966, 22, 647); deoxytubulosine, alangimarckine, mp. 184° , and ankorine from leaves (*Tetrahedron Lett.* 1966, 4965); choline chloride isolated from leaves (*Experientia* 1966, 22, 287; *J. Proc. Inst. Chem. Calcutta* 1967, 39, 62); betulinic acid, betulin aldehyde, betulin, lupeol and β -sitosterol from the seeds (*Phytochemistry* 1968, 7, 461); a new phenolic alkaloid - alangamide, mp. 213° - from seeds

(Indian J. Chem. 1969, 7, 635).

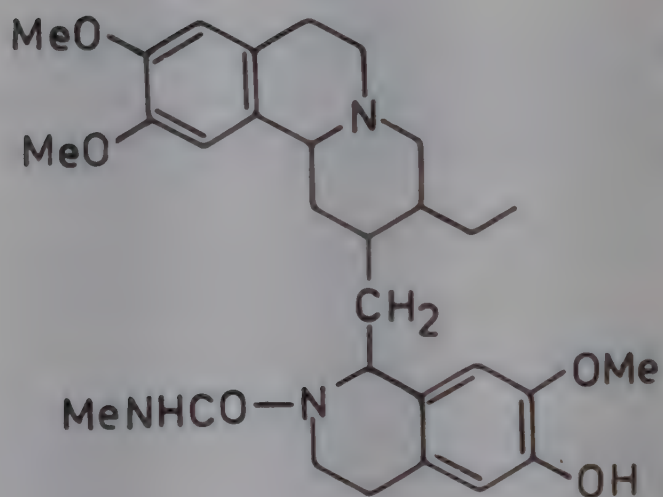
NEW COMPOUNDS



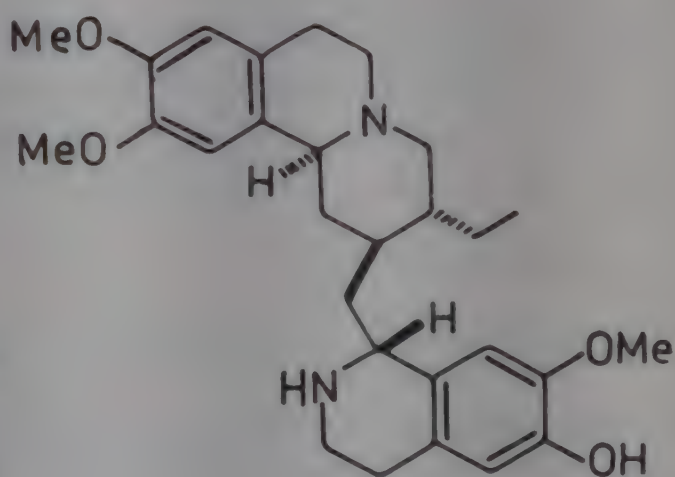
Alangine



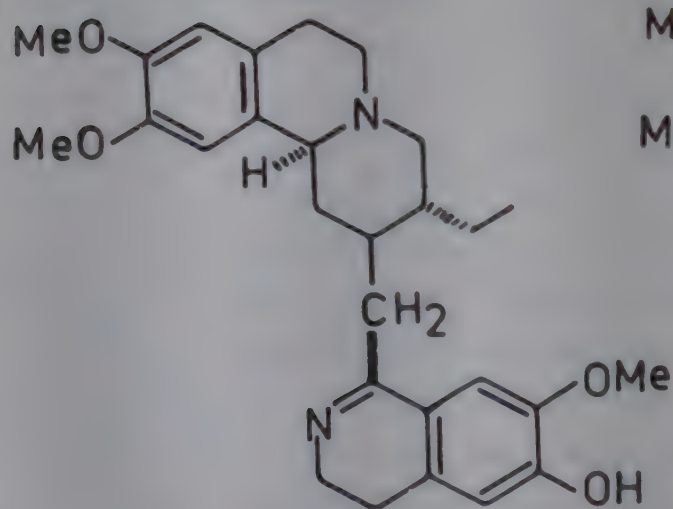
Ankorine



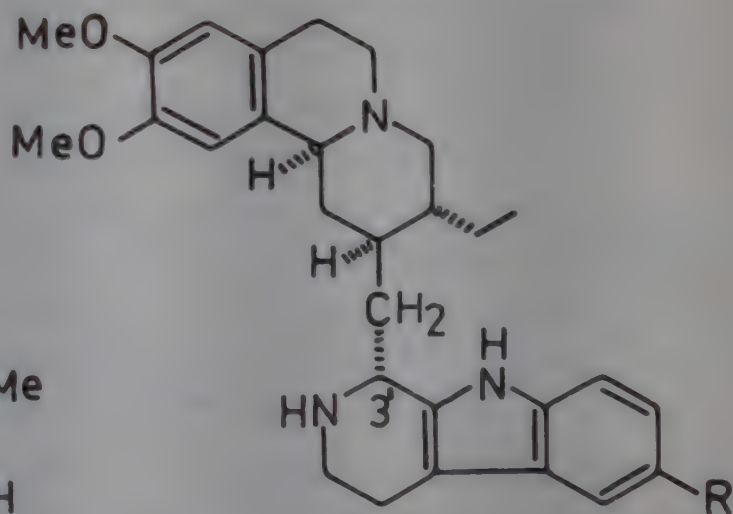
Alangamide



Cephaeline



Dimethylphychotrine



Tubulosine

R = OH

Isotubulosine(3'epimer)

R = OH

Deoxytubulosine

R = H

BIOLOGICAL ACTIVITY

An amorphous yellow alkaloid (AL60) from stem bark showed biphasic action on blood

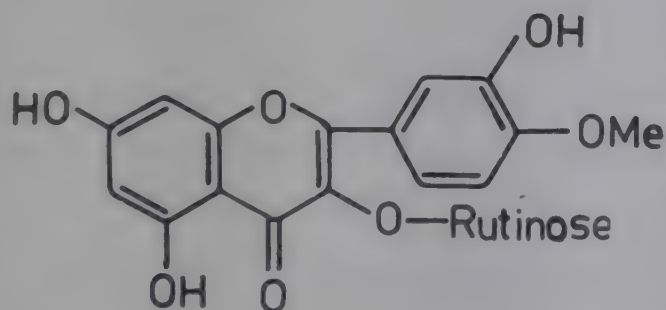
pressure of intact cats. At low dose it caused a brief temporary decrease in blood pressure followed by a permanent and prolonged increase. With high doses (0.4-1.6 mg/kg) considerably greater decrease occurred. In contrast, spinal cats showed only a brief high pressure with improvement in the cardio- dynamic activity independent of dosage (*Ann. Biochem. Exp. Med.* 1960, 20, 279; *Chem. Abstr.* 1964, 61, 16643 f; *Ann. Biochem. Exp. Med.* 1962, 22, 23; *Chem. Abstr.* 1962, 59, 7847 a); in intact cats, AL60 in low dose induced a positive inotropic effect in cardiac muscle but in higher dose it depressed the heart. It exerted spasmodic and spasmolytic effects in smooth muscle in low and high doses respectively (*Ann. Biochem. Exp. Med.* 1962, 22, 129; *Chem. Abstr.* 1962, 57, 14381 b).

ALBIZIA (ALBIZZA) (Mimosaceae)

A. amara (Roxb.) Boivin (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 10).

Echinocystic acid from seeds (*J. Sci. Ind. Res.* 1962, 21B, 347); β -sitosterol isolated (*Indian J. Pharm.* 1965, 27, 232); α , β - unsaturated carboxylic acid methyl ester, a new flavonol glycoside - 4'-O-methylquercetin-3-rutinoside - and a triterpene saponin, mp. 160°, from leaves (*Indian J. Chem.* 1967, 5, 613).

NEW COMPOUNDS

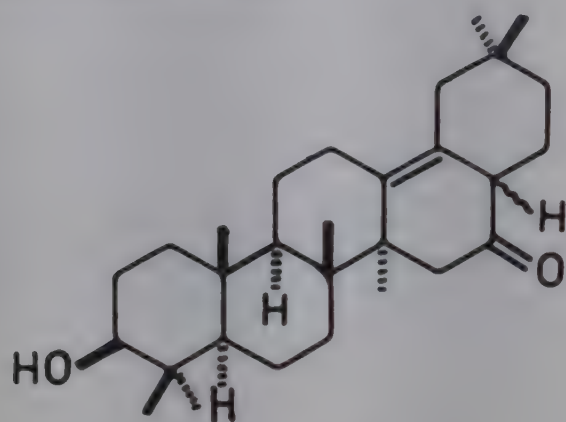


4'-O-Methylquercetin-3-rutinoside

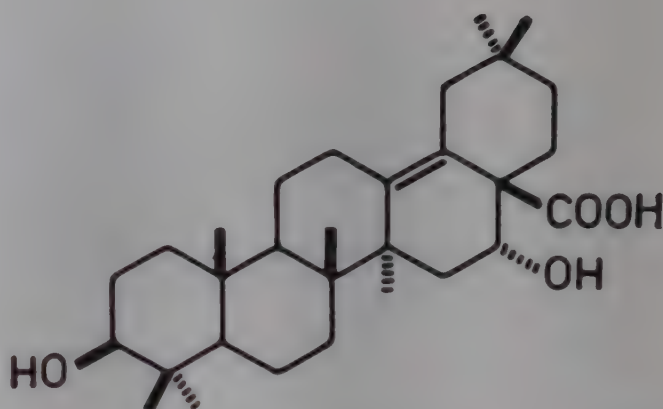
A. lebbeck (L.) Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 11).

New flavandiols - (-)-melacacidin, mp. 190° and lebbeacidin, mp. 200° - from heartwood (*Leather Sci.* 1965, 10, 362; *Chem. Abstr.* 1966, 64, 2045); d-catechin, leucocyanidin and condensed tannins (7-11%) in bark (*Leather Sci.* 1965, 12, 21; *Chem. Abstr.* 1965, 62, 10823 d); acacic acid, mp. 277°, from bark (*Indian J. Pharm.* 1961, 23, 331); a new triterpenoid sapogenin - albigenic acid - from beans, characterised as 3 β ,16 α -dihydroxy-13(18)-oleanen-28-oic acid (*Tetrahedron* 1959, 1, 19); albigenin, mp. 226°, - a new triterpene from leaves identified as 3 β -hydroxy-16-oxo-28-norolean-13(18)-ene (*Tetrahedron* 1962, 18, 155); benzyl acetate, benzyl benzoate and crocetin from flowers (*Indian J. Appl. Chem.* 1963, 26, 127).

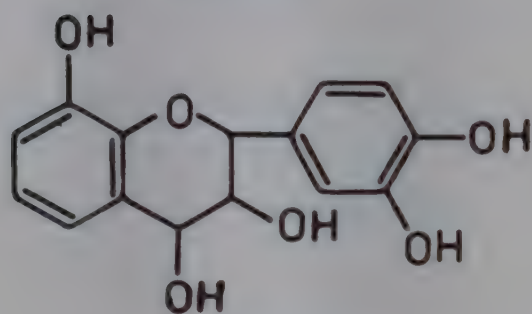
NEW COMPOUNDS



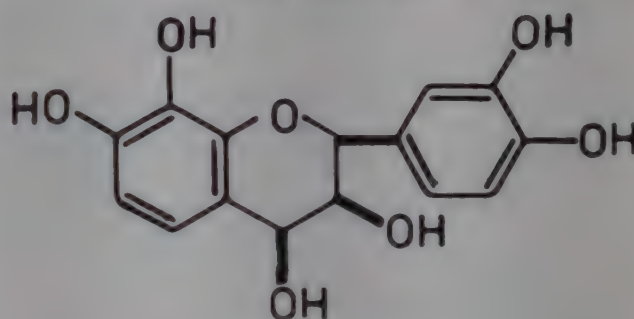
Albigenin



Albiginic acid



Lebbeacacidin



Melacacidin

A. lucida (Roxb.) Benth.

Assam - Sundi, Mazz; Manipur - Kametek; Cachar - Champa Sundi, B. - Sil, Koroi

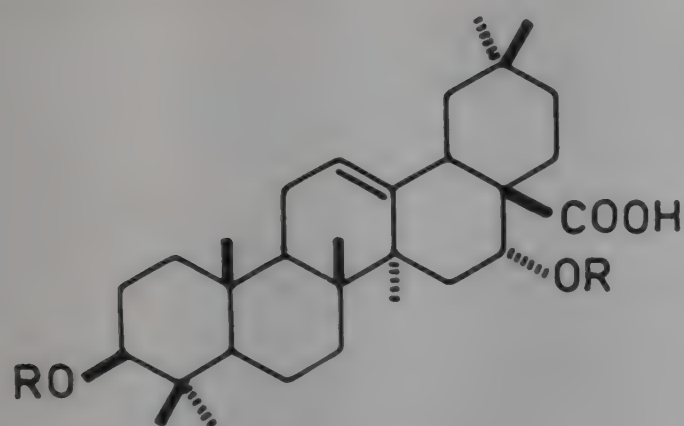
Echinocystic acid and a neutral triterpene from seeds (*Sci. Cult.* 1962, 28, 385).

Distribution : Nepal eastwards, ascending to about 800 m. in the hills.

A. odoratissima (L.f.) Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 11).

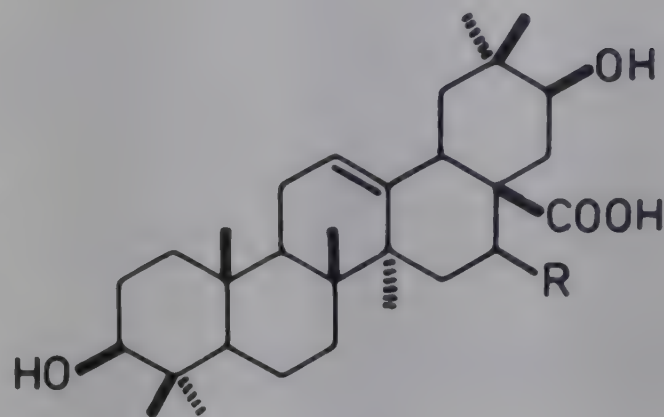
Machaerinic acid, mp. 266°, characterised as 3 β , 21 β -dihydroxy-18 β -olean-12-en-28-oic acid and an acid genin isolated (*J. Pharm. Sci.* 1961, 50, 923); odoratissimin, mp. 227°, composed of echinocystic acid, glucose, rhamnose, arabinose and xylose, from seeds (*J. Sci. Ind. Res.* 1962, 21B, 30); compounds A, mp. 85°, B, mp. 145° and a third compound which was methylated to give penta-O-methyl-dihydromelanoxetin, mp. 146°, isolated from heartwood (*Tetrahedron* 1963, 19, 1371); acacic acid, mp. 267° (*Bull. Chem. Soc. Jpn.* 1965, 38, 1214; *Trans. Bose Res. Inst. Calcutta* 1976, 39, 61).

NEW COMPOUNDS



Odoratissimin

R = Glu + Rha + Ara + Xyl



Acacic acid

R = α -OH

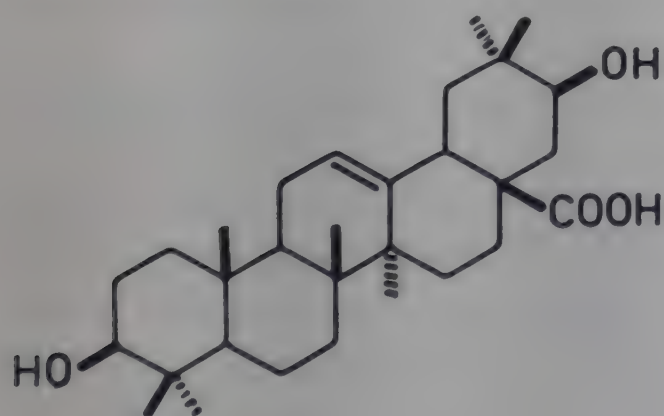
Machaerinic acid

R = H

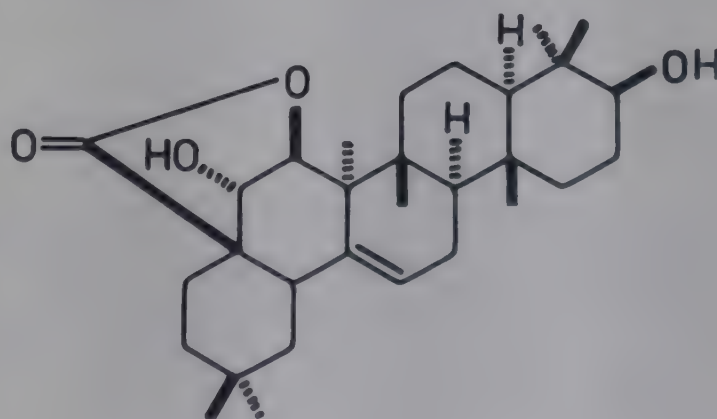
A. procera (Roxb.) Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 11).

β -Sitosterol (*Indian J. Pharm.* 1965, 27, 232); four triterpenoid sapogenins in addition to machaerinic and proceric acids (*Experientia* 1967, 23, 182); proceragenin A from seeds (*Tetrahedron Lett.* 1966, 5743); proceric acid characterised as 3β , 21β -dihydroxy- 18β -olean-12-ene-28-oic acid (*Bull. Nat. Inst. Sci. India* 1968, No. 37, 95).

NEW COMPOUNDS



Proceric acid



Proceragenin A

ALECTRA (Scrophulariaceae)

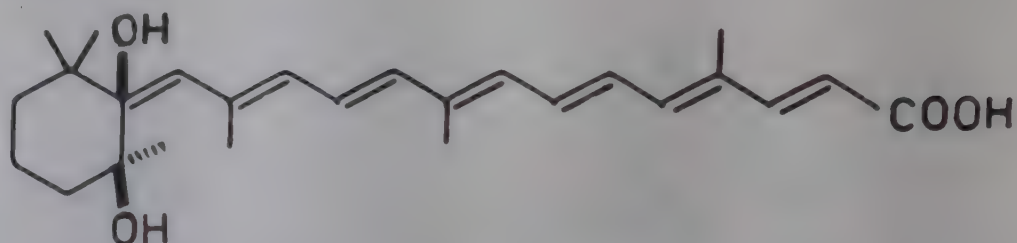
A. parasitica R. Rich. var. *chitrakutensis* Rau

Used in treatment of skin diseases especially leprosy.

Mannitol, mp. 163° , azafrin, mp. 210° (2%) and an acidic carotenoid (*Curr. Sci.* 1964, 33, 174).

Distribution : Chitrakoot and Banda in Uttar Pradesh.

NEW COMPOUNDS



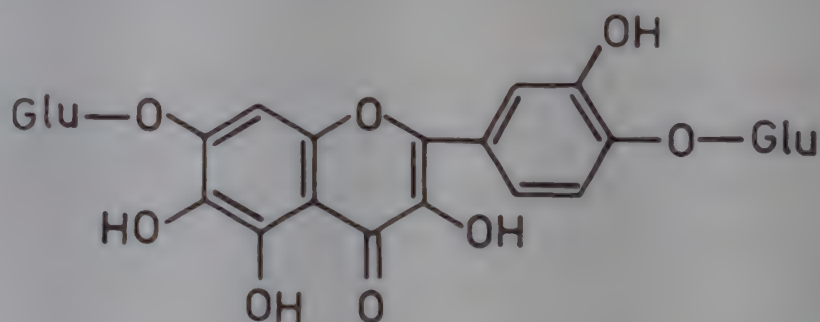
Azafrin

ALLIUM (Liliaceae)

A. ascalonicum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 11).

Quercitol, its 3,4'-diglucoside and 7,4'-diglucoside (I) isolated from bulbs and characterised (*C.R. Acad. Sci. Paris, Ser. D* 1967, 265, 2118; *Chem. Abstr.* 1968, 68, 75713 x).

NEW COMPOUNDS



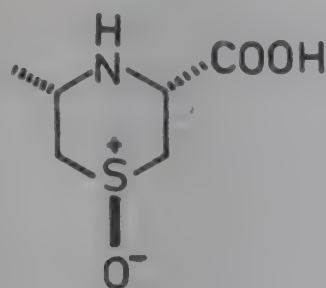
I

A. cepa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 11).

Total extractive has potent and prolonged hypoglycaemic effect in artificially-induced diabetes in rats and rabbits (*J. Egypt. Med. Assoc. Spl. No.* 48, 1965, 14; *Chem. Abstr.* 1967, 66, 93792 k); i.p. administration of purified water-soluble extract to rabbit caused marked leucocytosis and counteracted the leucopenic side-effect of antitumor agent, nitromin, but accelerated antitumor effect of nitromin on Yoshida sarcoma. LD₅₀ in mice 2.5 g/kg (*Eisei Shikenjo Hokoku* 1959, 399; *Chem. Abstr.* 1961, 55, 9643 b).

A new amino acid - cycloallin - isolated (*Acta Chem. Scand.* 1959, 13, 623); two trisaccharides - 1- β -fructosylsucrose and 6- β -fructosylsucrose - isolated (*Biochem. J.* 1959, 73, 507); presence of oleanolic acid (0.1%) and arabinose, rhamnose, xylose, ribose in glycosidic fraction shown (*Indian J. Appl. Chem.* 1959, 22, 89; *Chem. Abstr.* 1960, 54, 8999 e); (+)S-methyl-L-cysteine sulfoxide and (+)S-propyl-L-cysteine sulfoxide isolated as N-2,4-dinitrophenyl derivatives from bulb (*J. Org. Chem.* 1961, 26, 4997); carbohydrates from green leaf, bulb and root (*Nippon Nogeikagaku Kaishi* 1959, 33, 1018; *Chem. Abstr.* 1965, 62, 8118 f); histone from seedling roots (*Experientia* 1965, 21, 237); propenyl sulfenic acid from bulbs (*Bot. Mag.* 1966, 79, 506; *Chem. Abstr.* 1967, 66, 11293 u).

NEW COMPOUNDS



Cycloallin

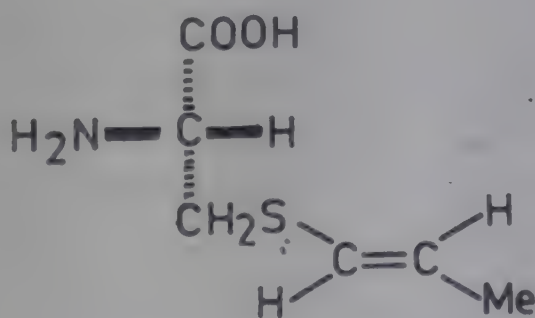
A. sativum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 12).

Garlic caused marked improvement in systolic and diastolic arterial tension in 114 hypertensive and atherosclerotic patients. It had beneficial prophylactic action. It had definite bactericidal effect on pathogenic micro-organisms (*Deut. Apoth.- Ztg.* 1966, 106, 1861; *Chem. Abstr.* 1967, 66, 74823 e); extracts of leaves, stems and bulb produced a stimulating, followed by inhibitory, effect on the uterus of non-pregnant guinea pigs; conversely, it produced stimulating effect on uterus of pregnant guinea pigs. It had slight effect on the intestine (*Jpn. J. Pharmacol.* 1969, 19, 1).

A. schoenoprasum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 12).

A compound which on enzymatic hydrolysis afforded glutamic acid and a new amino acid-S-(prop-1-enyl)cysteine - isolated from seeds (*Suomen Kemistilehti* 1962, 35, 245; *Chem. Abstr.* 1963, 68, 7135 h); isolation of S-(prop-1-enyl)cysteine from seeds (*Bot. Mag.* 1966, 79, 506; *Chem. Abstr.* 1967, 66, 112913 u).

NEW COMPOUNDS



S-(Prop-1-enyl)cysteine

ALLOPHYLUS (Sapindaceae)

A. cobbe (L.) Raeusch.

Mal. - Mukkannan-peru; Tam. - Naimaron, Muvelaneeli.

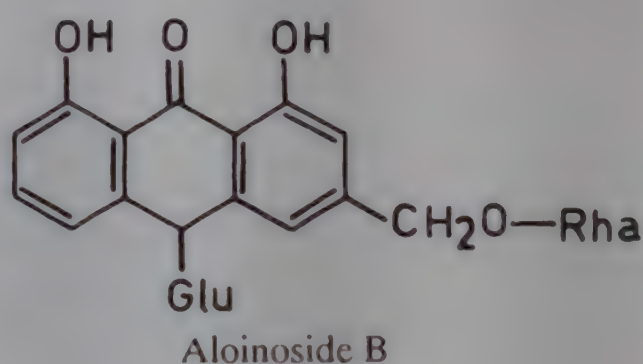
Benzylamide isolated from leaves (*Aust. J. Chem.* 1969, 22, 1315).

Distribution : Throughout south India, Khasi Hills and Andaman Islands.

ALOE (Liliaceae)

A. perryi Baker (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 13).

Glycoside - aloinoside B (2%) - isolated (*Z. Naturforsch.* 1964, 19, 222; *Chem. Abstr.* 1964, 61, 4465 e).

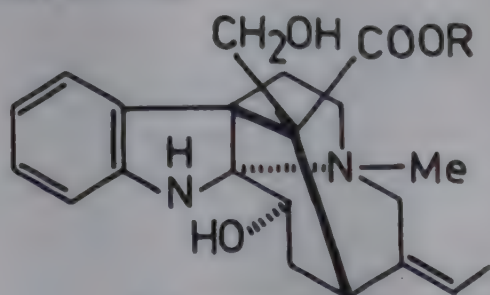
NEW COMPOUNDS**ALSTONIA (Apocynaceae)***A. neriifolia* D. Don

Lupeol, β -amyrin, nerifoline, mp. 292° , an indole alkaloid, mp. 292° and echitamine chloride from stem bark (*Sci. Cult.* 1960, 26, 238; *J. Indian Chem. Soc.* 1968, 45, 21).

Distribution : Tropical zones of Nepal, Sikkim and Bhutan.

A. scholaris (L.) R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 13).

Echitamine hydrochloride, mp. 286° , isolated (*Chem. Ind.* 1960, 19; *J. Indian Chem. Soc.* 1967, 44, 639; *Bull. Calcutta Sch. Trop. Med.* 1968, 16, 81); chemical degradation studies and structure assignment of echitamine (*Chem. Ind.* 1960, 265); crystal structure of echitamine (*J. Chem. Soc.* 1962, 5061); triterpenes- α -amyrin acetate, lupeol acetate, substance A, mp. 224° , and substance B, mp. 215° - isolated from bark (*J. Indian Chem. Soc.* 1960, 37, 637); an indole alkaloid - picrinine (desacetyl-desformyl-picraline) - isolated from leaves (*Tetrahedron Lett.* 1965, 3633); α -amyrin, its acetate, lupeol acetate, stigmasterol and α -sitosterol from root bark (*J. Indian Chem. Soc.* 1968, 45, 1183).

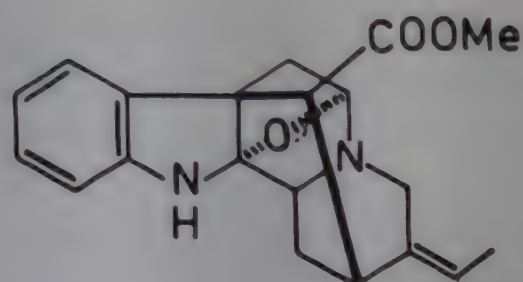
NEW COMPOUNDS

Echitamine

R = Me

Nerifoline

R = H

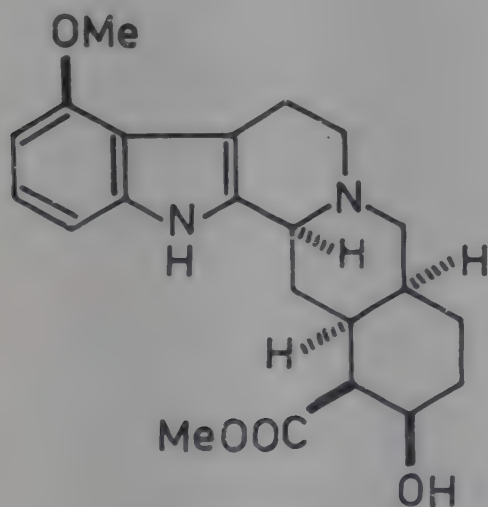


Picrinine

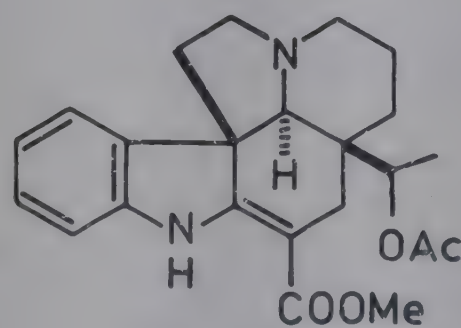
A. venenata R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 14).

A new indole alkaloid - alstovenine, mp. 172° - and another compound, mp. 194°, isolated from bark (*J. Indian Chem. Soc.* 1963, 40, 1043); structure of alstovenine and venenatine, mp. 130° (*J. Indian Chem. Soc.* 1964, 41, 638; *Tetrahedron Lett.* 1964, 901; *Tetrahedron* 1965, 21, 2951); isovenenatine, stigmasterol (0.0006%) and reserpine (0.02%), kepsinine, mp. 103° and norvenenatic acid HCl, mp. 306°; on the basis of physical evidence OMe group in venenatine and isovenenatine assigned to C-9 (*Tetrahedron* 1965, 21, 2957); venoxidine, mp. 218° (*Tetrahedron Lett.* 1965, 159); new echitovenidine, mp. 162°, and (+)-minovincinine (*Tetrahedron Lett.* 1966, 2483); new monoterpenoid alkaloid - venoterpine, mp. 128° - from fruits (*Tetrahedron Lett.* 1968, 2763); venalstonine, mp. 140°, venalstonidine, mp. 223° and echitovenine, mp. 168°, from stem bark (*Tetrahedron Lett.* 1965, 2239); configuration of venoterpine (*Experientia*, 1971, 27, 16).

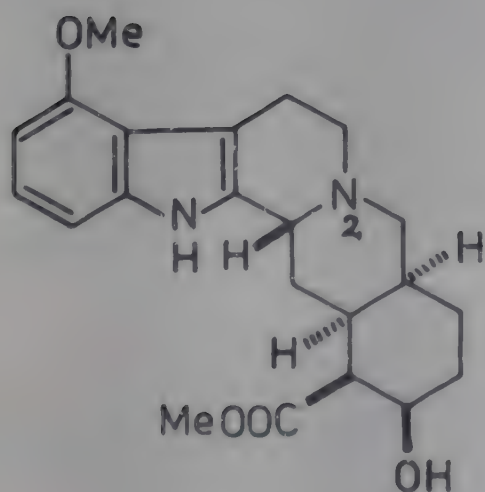
NEW COMPOUNDS



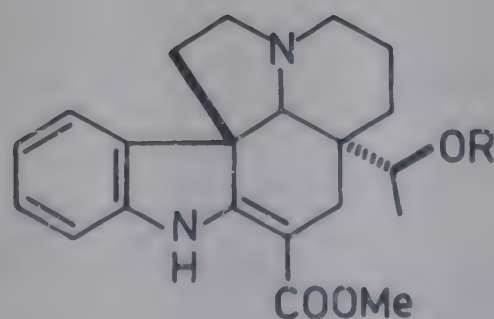
Alstovenine



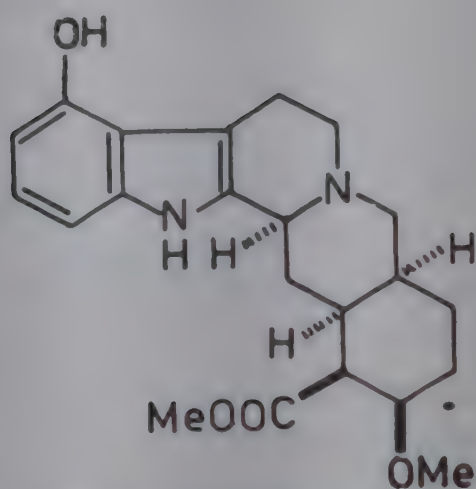
Echitovenine



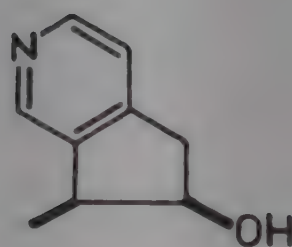
Venenatine
Venoxidine (N²-oxide)



Echitovenidine
R = Dimethylacryloyl
Minovincinine
R = H



Isovenenatine

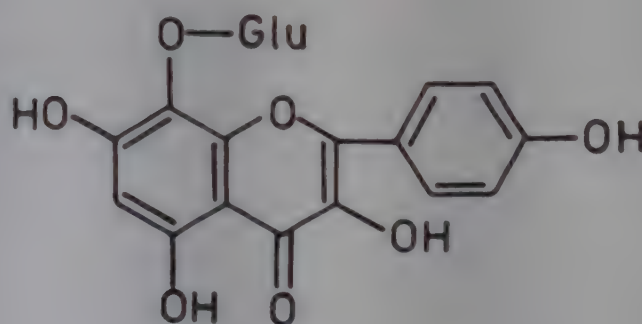


Venoterpine

ALTHAEA (Malvaceae)

A. rosea (L.) Cav. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 14).

A flavonol glycoside - herbacin - isolated (*Bull. Nat. Inst. Sci.*, India 1965, No. 31, 100; *Chem. Abstr.* 1967, 66, 46558 d); kaempferol, its 3-glucoside, quercetin, its 3-glucoside, cyanidin-3-glucoside and 3-rutinoside isolated (*Curr. Sci.* 1964, 33, 431).

NEW COMPOUNDS

Herbacin

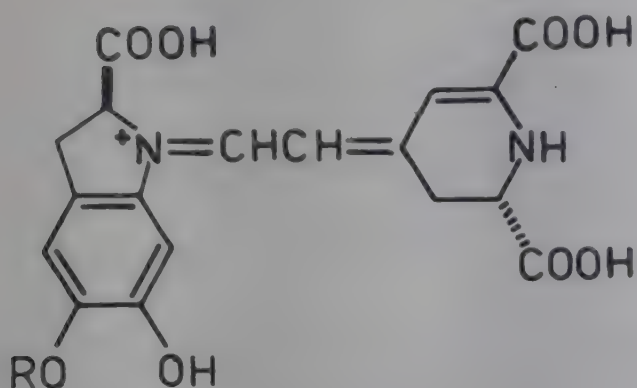
AMARANTHUS (Amaranthaceae)

A. gangeticus L.; see *A. tricolor* L.

A. tricolor L. syn. *A. gangeticus* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 15).

Amaranthine and isoamaranthine from leaves identified as O-(β -D-glucopyranosyluronic acid)-5-O- β -D-glucopyranosides of betanidine and isobetanidine respectively (*Ann. Chim.* 1964, 54, 963; *Chem. Abstr.* 1965, 62, 7853 g).

NEW COMPOUNDS



Amaranthine
R = Glu-Gluco.acid

AMARYLLIS (Amaryllidaceae)

A. equestris Ait. syn. *Hippeastrum equestre* Herb.

Pseudolycorine, lycorine and β -sitosterol from bulbs (*Curr. Sci.* 1969, 35, 291).

Distribution : Grown in gardens.

AMBERBOA (Asteraceae)

A. divaricata (DC.) Kuntze; see *Oligochaeta ramosa* (Roxb.) Wagenitz

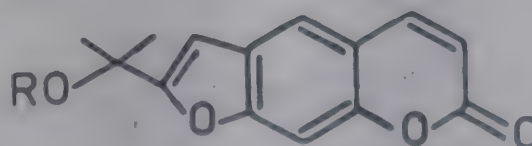
AMMI (Apiaceae)

A. majus L.

New furocoumarin - isopimpinellin, mp. 149°, in addition to xanthotoxin and bergapten from fruits (*Planta Med.* 1961, 9, 260; *Farmacia* 1967, 15, 493; *Chem. Abstr.* 1967, 67, 102702 f; *Farmacia* 1966, 14, 473; *Chem. Abstr.* 1967, 66, 118812 g); marmesin, mp. 189°, marmesinin and bergapten (*J. Org. Chem.* 1961, 26, 161; *Acta Pol. Pharm.* 1963, 20, 321; *Chem. Abstr.* 1965, 62, 399 c); ammajine, mp. 265° (*Farmacia* 1968, 16, 213; *Chem. Abstr.* 1968, 69, 12897 k); and isoimperatorin from fruits (*Rec. Trav. Chim* 1968, 87, 925; *Chem. Abstr.* 1968, 69, 96519 z).

Distribution : Introduced into India for trial cultivation for medicinal use. Also grown as a winter ornamental.

NEW COMPOUNDS

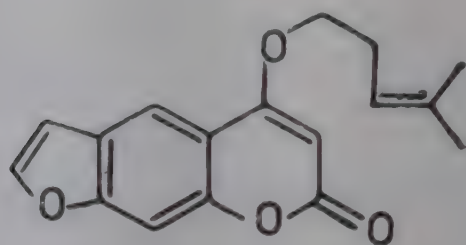


Marmesin

R = H

Marmesinin

R = Glu



Isoimperatorin

BIOLOGICAL ACTIVITY

The LD₅₀ of xanthotoxin, imperatorin and bergapten injected into ventral lymph sac of toad, was 13.75, 14 and 32 mg/100g and intramuscularly in rat was 16, 33.5 and 94.5 mg/kg respectively. In acute experiments all three compounds produced convulsions, gastrointestinal inflammation and congestion especially of right heart. Death resulted from respiratory failure (*J. Egypt. Med. Assoc.* 1957, 40, 465; *Chem. Abstr.* 1961, 55, 22588 h).

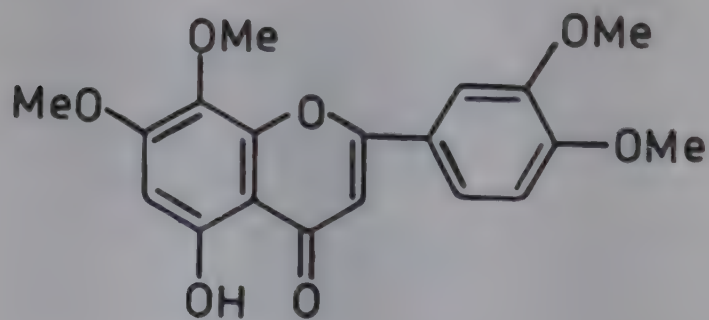
A. visnaga (L.) Lam.

Eng. - Honey plant

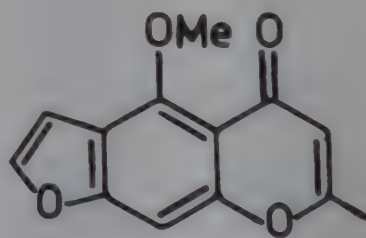
Structure of visnagin assigned (*Rev. Port. Quim.* 1958, 1, 305; *Chem. Abstr.* 1961, 55, 27258 e); khellinin shown to be khellin- β -glucopyranoside (*Ann. Chim.* 1959, 49, 894); *Chem. Abstr.* 1960, 54, 4558 f); detection of furanochromones especially khellin by paper chromatography (*Pharmazie* 1959, 14, 629; *Chem. Abstr.* 1960, 54, 12484 e); synthesis of ammiol and khellol (*J. Org. Chem.* 1961, 26, 886); stigmasterol glucoside (45%) and spinasterol glucoside (55%) identified in phytosterol mixture (*Arch. Pharm.* 1962, 295, 586; *Chem. Abstr.* 1962, 57, 15238 c); preparation of visnagin from fruits (*Farmacia* 1964, 12, 651; *Chem. Abstr.* 1965, 62, 6341 f); glycosides of myricetin, quercetin and kaempferol with sugars as glucose, xylose, rhamnose, glucuronic acid and rutinose, detected in leaves and fruits (*Planta Med.* 1964, 12, 232); a new flavone identified as 5-hydroxy-7,8,3',4'-tetramethoxyflavone (I) and rhamnazine from bergamot oil (*Tetrahedron* 1968, 24, 2121); seven glucosides - myricetin-3-xyloglucuronide, myricetin-3-xyloglucoside, myricetin-3-rhamnoglycoside, quercetin-3-rutinoside (rutin), kaempferol-3-rutinoside, quercetin-3-glucoside (isoquercetin) and kaempferol-3-glucoside (astragalin) - isolated (*Acta Pharm. Jugosl.* 1965, 15, 171; *Chem. Abstr.* 1966, 64, 18022 g).

Distribution : Introduced into India, grown for medicinal use.

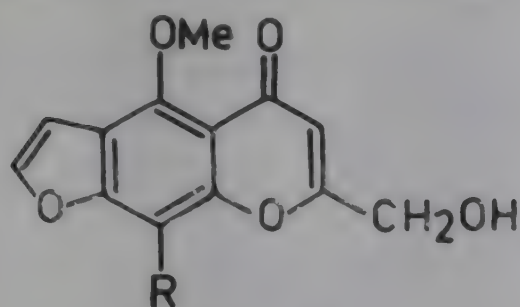
NEW COMPOUNDS



I



Visnagin



Khellol

R = H

Ammiol

R = OMe

BIOLOGICAL ACTIVITY

LD50 of promethazine and khellin in mice was 11.6-13.9 and 13.3- 13.7 mg/100g respectively. Administration of 1:2 mixture of promethazine and khellin showed additive synergistic effect on LD50 (*Bull. Soc. Pharm. Mars.* 1959, 8, 173; *Chem. Abstr.* 1960, 54, 21471 e); i.v. injection of an active substance from plant had specific coronary dilating action in dog and good therapeutic index (*Arch. Ital. Sci. Farmacol.* 1967, 11, 97; *Chem. Abstr.* 1962, 56, 12254 h); khellin and rutin (5-10 mg/kg s.c.) were almost equally effective against ulcers induced in rats by butadione (i.m. 120 mg/kg daily for 12 days in parallel with khellin or rutin dosage) (*Farmakol. Toksikol.* 1962, 25, 450; *Chem. Abstr.* 1963, 58, 1831 c).

AMOORA (Meliaceae)

A. rohituka W. & A.; see *Aphanamixis polystachea* (Wall.) Parker

ANACARDIUM (Anacardiaceae)

A. occidentale L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 17).

In diabetic rats level of blood sugar was markedly reduced by decoction of plant. A dose of 25 mg/kg produced hypoglycaemic effect in dogs (*Linn. Anais fac. Med. Univ. Recife, Brazil* 1958, 18, 193; *Biol. Abstr.* 1961, 36, 46306).

Ethyl gallate, hyperoside, methyl gallate, leucocyanidin and leucodelphinidin identified (*Phytochemistry* 1969, 8, 673).

ANAGALLIS (Primulaceae)

A. arvensis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 17).

A dihydroxyketo-oleanane derivative - anagallisgenone - isolated from stems and leaves (*C. R. Acad. Sci. Paris, Ser. D* 1969, 265, 2279).

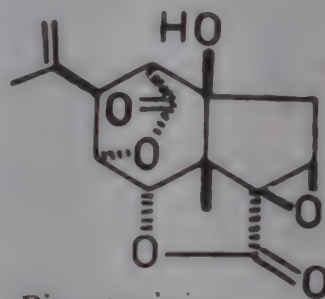
ANAMIRTA (Menispermaceae)

A. cocculus (L.) W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New

Delhi, 1956, p. 17).

Structure of picrotoxinin, isolated from berries and shrubs, confirmed by crystal structure analysis (*Tetrahedron Lett.* 1960, 21; *Acta Crystallogr.* 1962, 15, 287; *J. Am. Chem. Soc.* 1978, 101, 5841).

NEW COMPOUNDS



Picrotoxinin

ANDIRA (Papilionaceae)

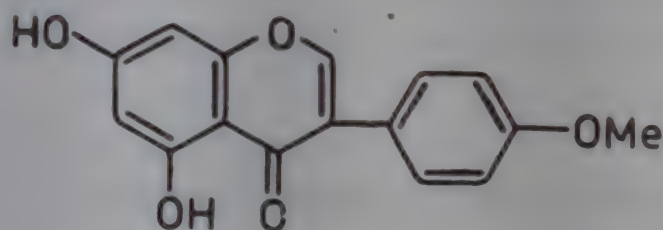
A. inermis Kunth

Eng. - Rain tree

Inermin, mp. 100°, and an isoflavonoid - biochanin A - from wood (*Chem. Ind.* 1962, 216).

Distribution : Tropical American tree, introduced in Calcutta gardens and elsewhere.

NEW COMPOUNDS



Biochanin A

ANDRACHNE (Euphorbiaceae)

A. rotundifolia C.A. Mayer; see *A. telephioides* L.

A. telephioides L. syn. *A. rotundifolia* C. A. Mayer

An alkaloid - andrachnine, mp. 97° - isolated from aerial and subterranean parts (*Khim. Prir. Soedin.* 1966, 2, 257; *Chem. Abstr.* 1967, 66, 484 x).

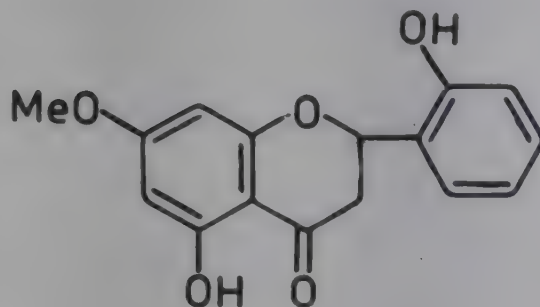
Distribution : Punjab.

ANDROGRAPHIS (Acanthaceae)

A. echinoides (L.) Nees (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 18).

Used as remedy for fever. Echioidinin, mp. 245°, characterised as 5,2'-dihydroxy-7-methoxyflavone and its glucoside, echioidin, mp. 261°, isolated (*Tetrahedron* 1965, 21, 2633).

NEW COMPOUNDS



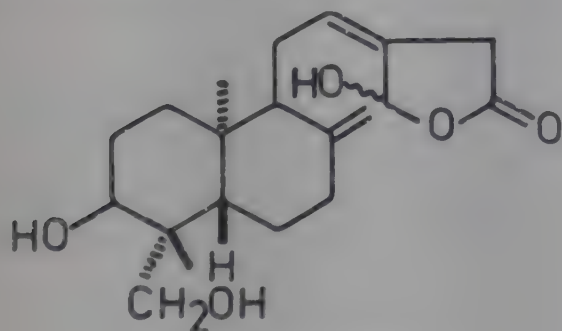
Echioidinin

A. paniculata (Burm.) Wall. ex Nees (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 18).

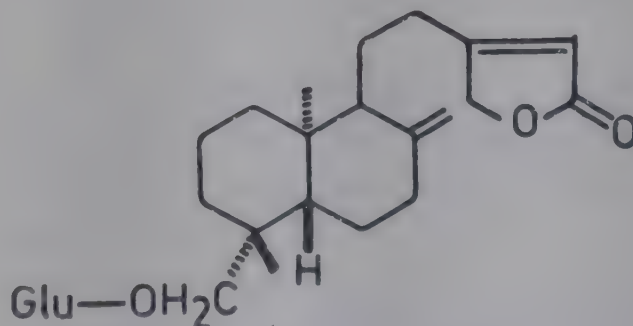
Used as curative or preventive in snake venom poisoning (*Indian Med. J.* 1963, 57, 307).

Pigments - andrographin, mp. 190° and panicolin, mp. 263° - from roots (*Sci. Res.* 1964, 17, 223; *Chem. Abstr.* 1965, 62, 8119 h); β -sitosterol-glucoside, mp. 298°, a compound, mp. 230°, and an unsaturated ketone, mp. 113°, isolated from leaves (*Pakistan J. Sci. Ind. Res.* 1964, 1, 14; *Chem. Abstr.* 1964, 60, 13571 e); structure and stereochemistry of andrographolide, mp. 228°, on the basis of chemical degradation (*J. Sci. Ind. Res.* 1962, 21B, 281; *Indian J. Chem.* 1968, 6, 252); diterpene glucoside - neoandrographolide, mp. 167° (*Tetrahedron Lett.* 1968, 4803); a new flavone - 5-hydroxy-7,8,2',3'-tetramethoxyflavone (I) - from roots (*Indian J. Chem.* 1969, 7, 306).

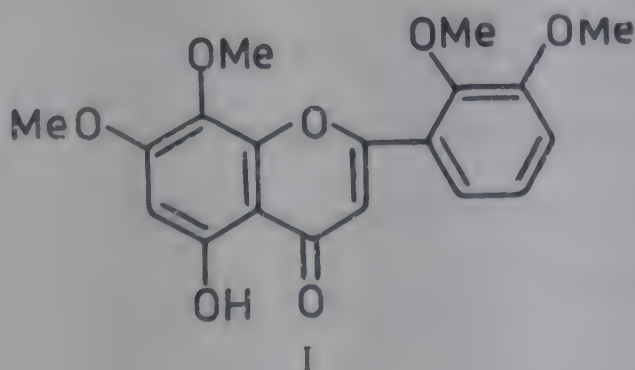
NEW COMPOUNDS



Andrographolide



Neoandrographolide



I

A. serpyllifolia (Vahl.) Wight

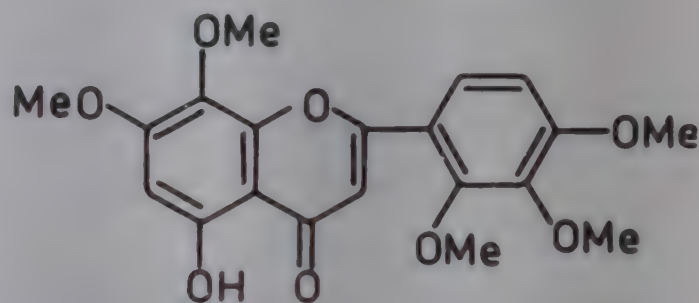
Kan. - Kasinasara, Saradaligedde.

Serpyllin isolated and characterised as 5-hydroxy-7,8,2',3',4'-pentamethoxyflavone

(*Tetrahedron* 1968, 24, 7027).

Distribution : Andhra Pradesh and southwards, in plains.

NEW COMPOUNDS



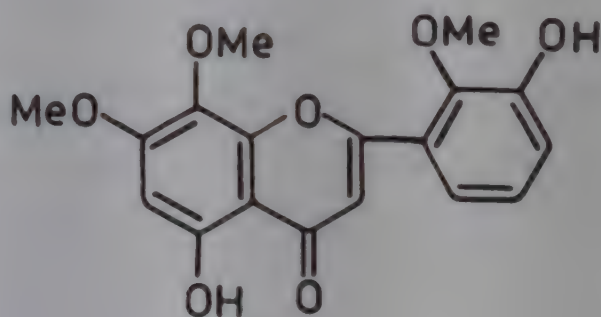
Serpyllin

A. wightiana Arn. ex Nees

A new flavone - wightin, mp. 160° - isolated from stems and roots and echioidinin, mp. 243°, from leaves (*Tetrahedron* 1965, 21, 3237); total synthesis of wightin and echioidinin (*Tetrahedron* 1967, 23, 741); synthesis of wightin (5,3'-dihydroxy-7,8,2'-trimethoxyflavone) (*Indian J. Chem.* 1969, 7, 110).

Distribution : Western Ghats, Annamalais and hills of Travancore and Tinnevely, ascending upto 800 m.

NEW COMPOUNDS



Wightin

ANDROPOGON (Poaceae)

A. intermedius R. Br.; see *Bothriochloa intermedia* (R. Br.) A.Camus

A. nardus L.; see *Cymbopogon nardus* (L.) Rendle

A. sorghum Brot.; see *Sorghum bicolor* (L.) Moench.

A. squarrosus Hook. f.; see *Vetiveria zizanioides* (L.) Nash

ANEMARRHENA (Liliaceae)

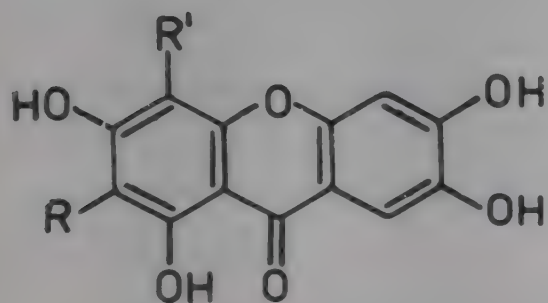
A. asphodeloides Bunge

Sarsasapogenin, mp. 198°, markogenin, mp. 256°, neogitogenin, mp. 253° and saponins - timosaponin A-III, mp. 317° characterised as sarsasapogenin-O-β-D-glucopyranosyl-(1→2)-β-D-galactopyranoside and timosaponin B-1, mp. 170° - from rhizomes (*Yakugaku Zasshi*

1963, 83, 892; *Chem. Abstr.* 1964, 60, 592 d; *Chem. Pharm. Bull.* 1963, 11, 1221); a new xanthone C-glycoside - isomagniferin - and magniferin isolated from aerial part of plant and characterised (*Tetrahedron Lett.* 1969, 941).

Distribution : Introduced into Indian gardens as ornamental.

NEW COMPOUNDS

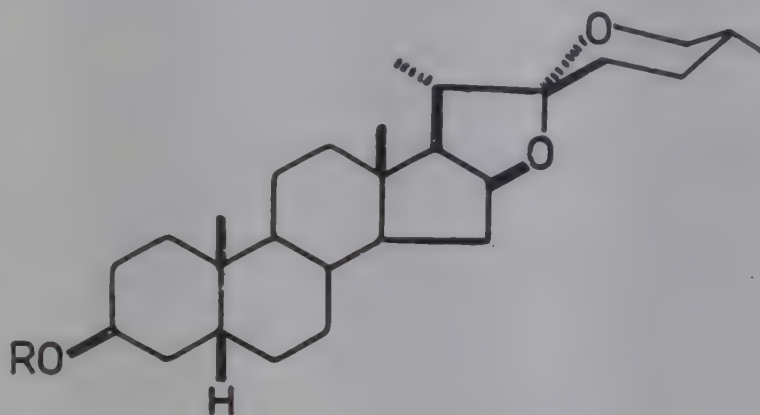


Magniferin

R = Glu, R' = H

Isomagniferin

R = H, R' = Glu



Timosaponin A-III

R = Gal(2→1)Glu

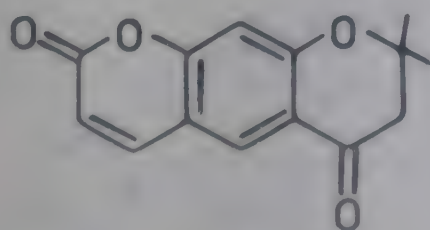
ANETHUM (Apiaceae)

A. graveolens L. syn. *A. sowa* Roxb. ex Flem., *Peucedanum graveolens* (L.) Benth. & Hook. f., *P. sowa* Kurz (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 19).

Scopoletin and new coumarin (I) characterised as 6,7-dihydro-8,8-dimethyl-2H,8H-benzo-[1,2-b:5,4-b']dipyran-2,6-dione from dill (*J. Chem. Soc. C* 1967, 2593); α -pinene, d-limonene, α -phellandrene and dillapiol present in essential oil (*Riechst. Aromen, Koerperpflegung* 1969, 19, 185; *Chem. Abstr.* 1969, 71, 33329 h).

Note: *Anethum sowa* has been wrongly assigned to Kurz in literature (Wealth of India 1: 78, 1948; Dictionary of the Flowering Plants of India 12, 1976, (rep. ed.) by Santapau and Henry; *Glossary Indian Medicinal Plants* 19, 1956, by Chopra et al), since Kurz described it as *Peucedanum sowa* which was kept under *Peucedanum graveolens* Benth. & Hook. f. Fl. Brit. India II; 709, 1879. Recently Nasir (in Nasir and Ali, Fl. West Pak. No. 20, 111, 1972) has treated *A. graveolens* L. and *A. sowa* Roxb. ex Flem. as one species, and *A. graveolens* L. as being the valid name.

NEW COMPOUNDS



I

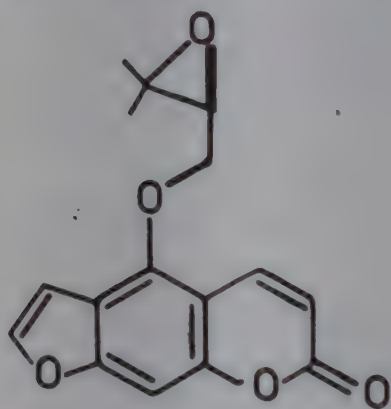
A. sowa Roxb. ex Flem.; see *A. graveolens* L.

ANGELICA (Apiaceae)

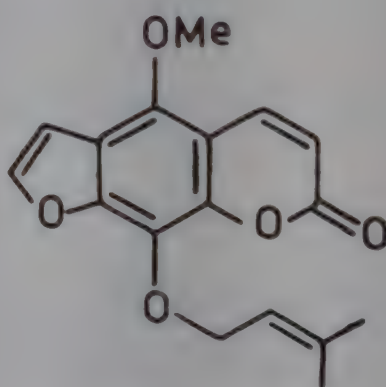
A. archangelica L. syn. *Archangelica officinalis* (Moench.) Hoffm. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 19).

Furocoumarins - angelican, mp. 139° , prangolarin, mp. 104° , archangelin, mp. 132° - a phenolic compound - angelicain, mp. 194° - and a flavanoid - archangelicain, mp. 129° - from roots (*Tetrahedron Lett.* 1964, 1961); phellopterin from fruit identified as 4-methoxy-7-(γ , γ -dimethylallyloxy)-psoralen by degradation and synthesis (*Arch. Pharm.* 1965, 298, 672; *Chem. Abstr.* 1966, 64, 3956 b); umbelliprenin, isoimperatorin, bergapten, prangolarin, ostruthol and oxypeucedanin hydrate from seeds (*J. Indian Chem. Soc.* 1967, 44, 110); archangelin, prangolarin, angelicain, ostruthol, mp. 138° and oxypeucedanin hydrate, mp. 134° , from roots (*Indian J. Chem.* 1968, 6, 415).

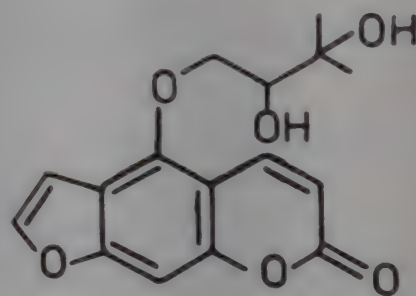
NEW COMPOUNDS



(R)Prangolarin



Phellopterin



Oxypeucedanin hydrate

A. glauca Edgew. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 19).

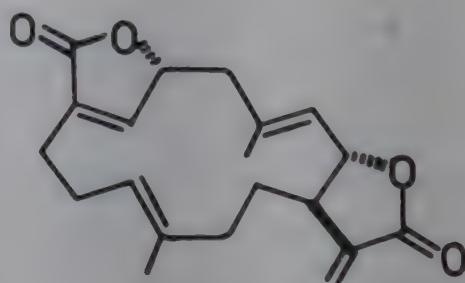
A lactone (0.06%), mp. 101° , from fruits (*Proc. Nat. Acad. Sci. India* 1960, 29A, 283; *Chem. Abstr.* 1961, 55, 18682 i).

ANISOMELES (Lamiaceae)

A. indica (L.) Kuntze syn. *A. ovata* R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 19).

A macrocyclic diterpene - ovatodioid, mp. 148° - isolated from leaves and its structure revised (*Tetrahedron* 1965, 21, 2117; *J. Org. Chem.* 1977, 42, 3824).

NEW COMPOUNDS



Ovatodioid

A. ovata R. Br.; see *A. indica* (L.) Kuntze

ANOGEISSUS (Combretaceae)

A. latifolia (Roxb. ex DC.) Wall. ex Bedd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 20).

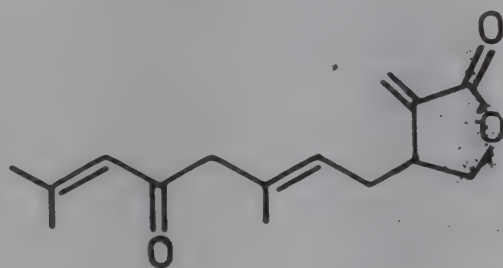
A glucoside, mp. 158°, isolated from leaves (*Bull. Central Leather Res. Inst. India* 1960, 6, 529; *Chem. Abstr.* 1960, 54, 25084 d).

ANTHEMIS (Asteraceae)

A. cotula L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 20).

An optically active sesquiterpene lactone (I) isolated (*Tetrahedron Lett.* 1969, 2417).

NEW COMPOUNDS

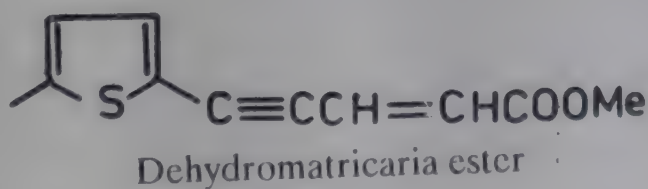


I

A. nobilis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 20).

Trideca-1,3,5-triene-7,9,11-triynone (I), trans-dehydromatricaria ester, mp. 49°, and its cis-isomer isolated from roots (*Chem. Ber.* 1962, 95, 1733); a sesquiterpene lactone - nobilin, mp. 177° - from flowers (*Collect. Czech. Chem. Commun.* 1964, 29, 3096; *Tetrahedron Lett.* 1970, 5017).

NEW COMPOUNDS



I

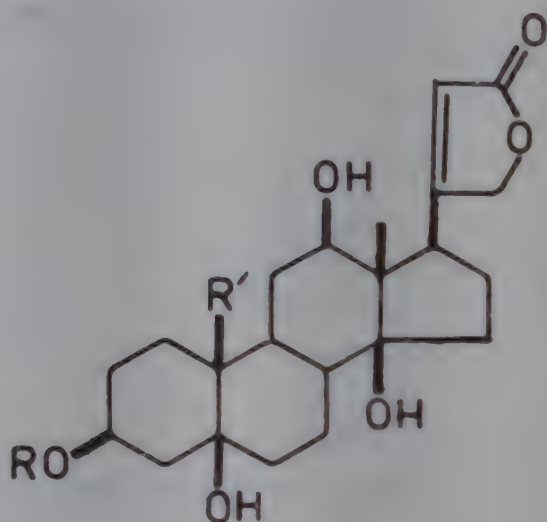
ANTIARIS (Moraceae)

A. toxicaria (Pers.) Lesch. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 21).

α-Antiarin, mp. 243°, β-antiarin, mp. 245°, convallatoxin, mp. 222°, evomonoside, mp. 232°, malayoside, mp. 220°, substance E, mp. 272°, deglucocheirotxin, mp. 180°, substance M, mp.

220°, convallatoxol, mp. 212°, α -antioside, mp. 193° and antioside, mp. 183°/222°, from latex (*Helv. Chim. Acta* 1962, 45, 1183); sixteen cardenolides isolated from seeds, six of these were new compounds - strophanthojavoside, antiarojavoside, antiogoside, mp. 184°, antialloside, mp. 227°, uposide, mp. 175° and antiosemoside, mp. 190° - which were characterised; others identified as cymarin, mp. 131°, cymarol, mp. 213°, strophanthidin, mp. 139°, strophalloside, mp. 177°, periplogenin, mp. 225°, peripalloside, mp. 162°, periplorhamnoside, mp. 205°, antiogenin, mp. 258°, convallatoxin and antioside (*Helv. Chim. Acta* 1964, 47, 2164; *Ann. Chem.* 1965, 685, 253); convalloside, mp. 241°, isolated from sap (*Helv. Chim. Acta* 1966, 49, 2469).

NEW COMPOUNDS



Antialloside

R = 6-Deoxyallose, R' = CHO

Antiarojavoside

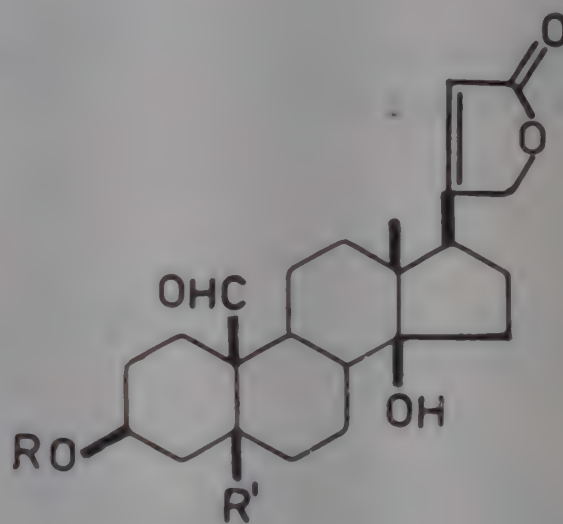
R = Javose, R' = CHO

α -Antioside

R = Gulomethylose, R' = Me

Antioside

R = Rha, R' = Me

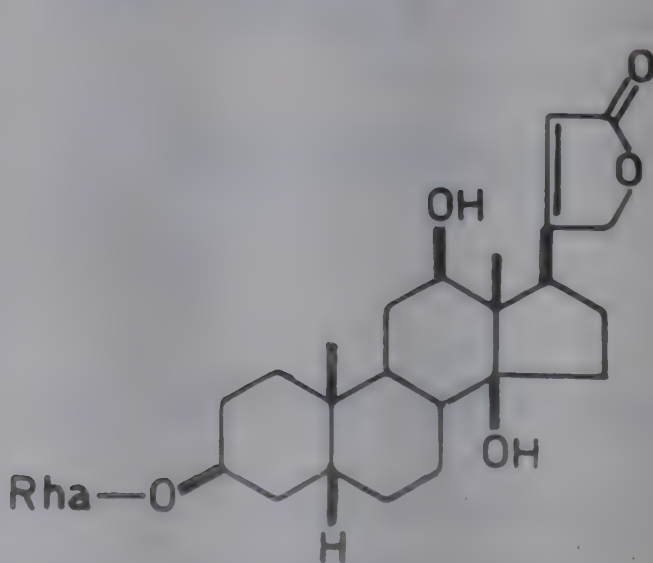


Malayoside

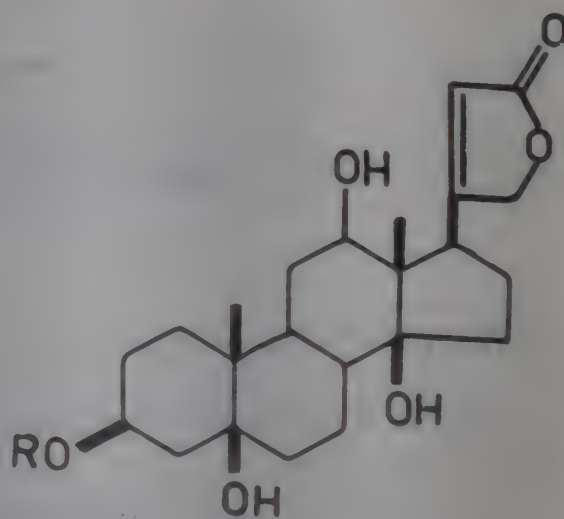
R = Rha, R' = H

Strophanthojavoside

R = Javose, R' = OH



Substance E



Antiogoside

R = 6-Deoxyallose,

ANTIRRHINUM (Scrophulariaceae)*A. majus* L.

Eng. - Antirrhinum, Snapdragon.

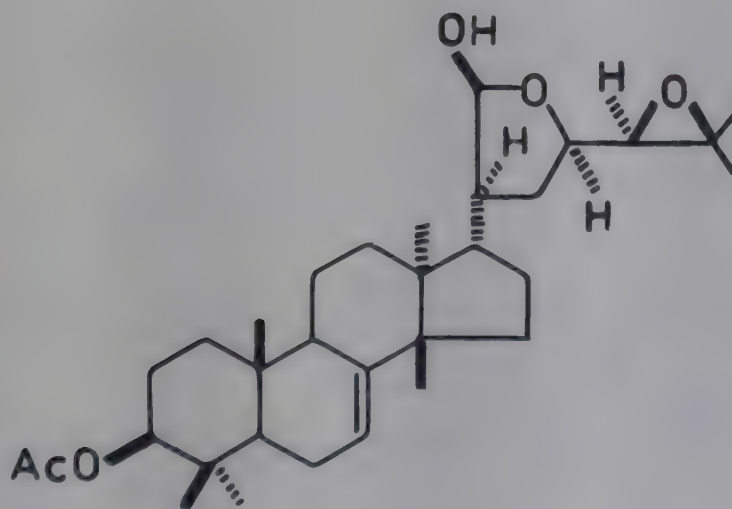
Apigenin, aureusidin, kaempferol, luteolin, quercetin, cyanidin and pelargonidin from petals (*J. Genet.* 1958, 56, 28; *Chem. Abstr.* 1960, 54, 14376 a); apigenin-7,4'-diglucuronide, luteolin-7-glucuronide, chrysoeriol-7-glucuronide, kaempferol-3-glucoside and kaempferol-3,7-diglucoside (*Phytochemistry* 1963, 2, 237); branched chain fatty acids identified in flowers (*Z. Physiol. Chem.* 1965, 341, 192; *Chem. Abstr.* 1966, 64, 7047 b).

Distribution : Cultivated in India as ornamental.

APHANAMIXIS (Meliaceae)

A. polystachya (Wall.) Parker syn. *Amoora rohituka* W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 21).

Amoorin, bp. 105°, and a sterol, mp. 135°, from essential oil of seeds (*Pakistan J. Sci. Ind. Res.* 1960, 3, 122; *Chem. Abstr.* 1961, 55, 27545 i); a new triterpene - aphanamixin, mp. 232° from fruit shell closely related to flindissol and melianone (*Tetrahedron Lett.* 1967, 1471); aphanamixol, 130°, from leaves (*J. Indian Chem. Soc.* 1968, 45, 208).

NEW COMPOUNDS

Aphanamixin

APIUM (Apiaceae)

A. graveolens L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 21).

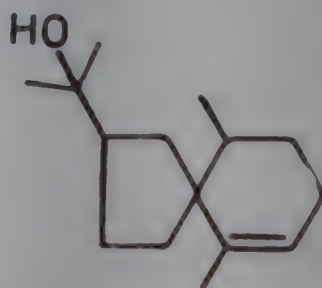
Essential oil found to possess tranquillising as well as anticonvulsant activities (*Indian J. Med. Res.* 1967, 55, 1099).

A. petroselinum L.; see *Petroselinum crispum* (Mill.) A.W. Hill

AQUILARIA (Thymelaeaceae)

A. agallocha Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 22).

A sesquiterpenoid - agarospirol - isolated from oil from plant and characterised (*Tetrahedron* 1965, 21, 115).

NEW COMPOUNDS

Agarospirol

ARALIA (Araliaceae)

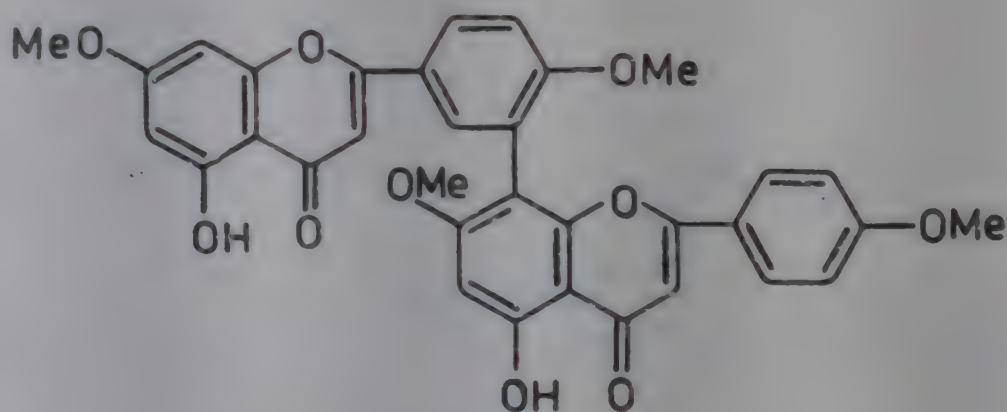
A. quinquefolia Decne. & Planch.; see *Panax ginseng* C.A. Mey

ARAUCARIA (Araucariaceae)

A. cookii R. Br. ex D. Don

Optically active biflavone isolated and characterised as (+)4',4'',7,7''-tetramethoxyamentoflavone (I) (*Experientia* 1969, 25, 350).

Distribution : Introduced into India as ornamental tree.

NEW COMPOUNDS

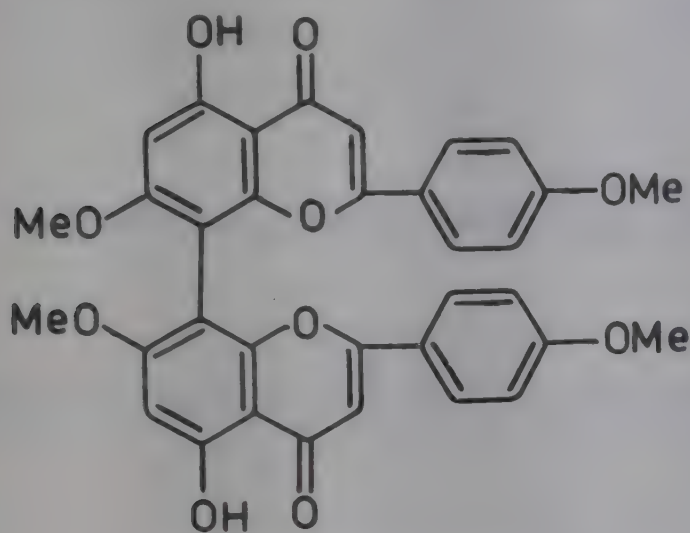
I

A. cunninghamii D. Don

A new biflavonyl AC-3 characterised as 5,5''-dihydroxy-7,7',4',4''-tetramethoxybiflavone isolated from leaves (*Tetrahedron Lett.* 1968, 675).

Distribution : Introduced in India as ornamental plant.

NEW COMPOUNDS



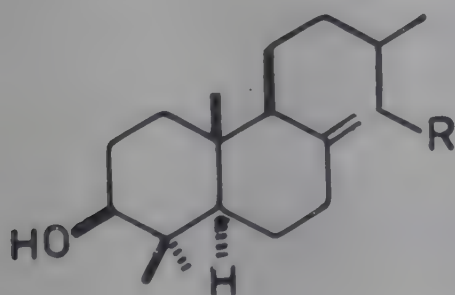
Biflavonyl AC-3

A. imbricata Pav.

Two new diterpenes - labd-8(20)-en-3 β ,15-diol, mp. 114° and 3 β -hydroxylabd-8(20)-en-15-oic acid - from bark (*J. Chem. Soc.* 1964, 3648); structure of imbricatol acid elucidated (*Tetrahedron Lett.* 1966, 1901); β -(R) configuration at C-13 in 19-oxolabd-8(20)-en-15-ol determined (*Tetrahedron* 1968, 24, 3417).

Distribution : Introduced into India as an ornamental plant.

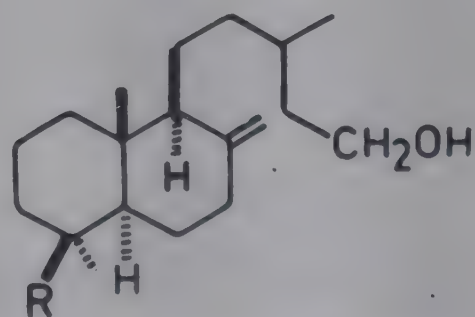
NEW COMPOUNDS

3 β -Hydroxylabd-8(20)-en-15-oic acid

R = COOH

Labd-8(20)-en-3 β ,15-diol

R = CH₂OH



Imbricatol acid

R = COOH

19-Oxolabd-8(20)-en-15-ol

R = CHO

ARCHANGELICA (Apiaceae)

A. officinalis (Moench.) Hoffm.; see *Angelica archangelica* L.

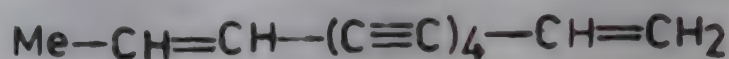
ARCTIUM (Asteraceae)

A. lappa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 22).

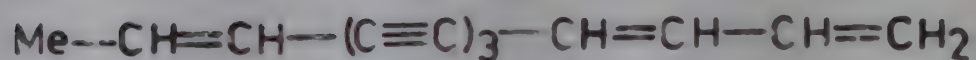
A tumor growth-inhibiting mixture isolated from root (*Acta Univ. Szeged.*, *Acta Phy. Chem.* 1964, 10, 91; *Chem. Abstr.* 1965, 62, 6339 c); polyacetylene mixture consisted of 1,11-

tridecadien-3, 5,7,9-tetrayne (I) and 1,3,11-tridecatrien-5,7,9-triynone (II) (50%), both compounds bacteriostatic and fungistatic (*Arzneim. Forsch.* 1967, 17, 829).

NEW COMPOUNDS



I



II

ARCTOSTAPHYLOS (Ericaceae)

A. uva-ursi Spreng. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 22).

Three arbutin galloyl esters isolated and their structures established (*J. Chem. Soc.* 1965, 7312).

ARDISIA (Myrsinaceae)

A. macrocarpa Wall.

Rapanone, mp. 140°, leucodelphinidin and a leucoanthocyanidin - 3,4,5,7,3',4',5'-heptahydroxyflavan - from bark, heartwood, flowers and berries (*Curr. Sci.* 1969, 58, 90).

Distribution : Himalayas, Nepal to Bhutan at 900-2100 m.

ARECA (Arecaceae)

A. catechu L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 23).

Aqueous extract preparation exhibited both direct vasoconstriction and adrenaline potentiation in rat hind limb perfusion test (*Curr. Sci.* 1963, 32, 455).

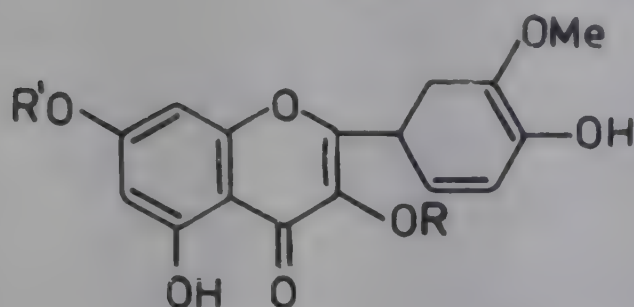
Leucocyanidin (acetate, mp. 123°) from nuts (*J. Sci. Ind. Res.* 1961, 20B, 615).

ARGEMONE (Papaveraceae)

A. mexicana L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 23).

Protopine nitrate (0.03%), berberine nitrate (0.05%), ceryl alcohol, β -sitosterol, an alcohol, mp. 73° and succinic, citric, tartaric and maleic acids, glucose and fructose, isolated (*J. Sci. Ind. Res.* 1961, 20B, 186); a flavonoid - isorhamnetin-7-diglucoside, mp. 202° - from flowers (*J. Org. Chem.* 1962, 27, 153); two flavonol glycosides - isorhamnetin-3-glucoside, mp. 135° and isorhamnetin-3,7-diglucoside - from flowers (*Indian J. Chem.* 1965, 3, 270).

NEW COMPOUNDS



Isorhamnetin-3-glucoside

R = Glu, R' = H

Isorhamnetin-3,7-diglucoside

R = Glu, R' = Glu

Isorhamnetin-7-diglucoside

R = H, R' = Glu-glu

ARGYREIA (Convolvulaceae)

A. nervosa (Burm.f.) Boj. syn. *A. speciosa* (L.f.) Sweet (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 24).

Eragine, isoeragine and penniclavine from seeds identified by TLC and PC (*Sci.* 1965, 148, 499).

A. speciosa (L.f.) Sweet; see *A. nervosa* (Burm.f.) Boj.

A. tiliifolia Wight; see *Strictocardia tiliifolia* (Desr.) Haillier, f.

ARISTOLOCHIA (Aristolochiaceae)

A. bracteata Retz.; see *A. bracteolata* Lamk.

A. bracteolata Lamk. syn. *A. bracteata* Retz. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 24).

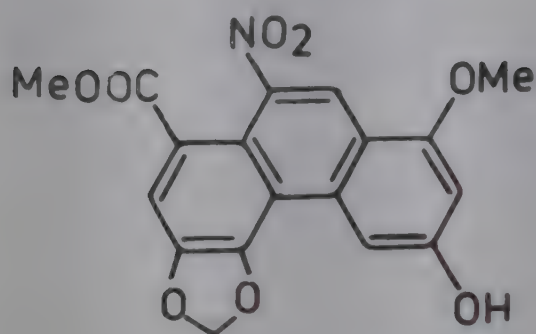
Ceryl alcohol, β -sitosterol, aristolochic acid and KCl from leaves; aristolochic acid, KCl and KNO₃ from roots (*Indian J. Pharm.* 1965, 27, 264).

A. indica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 24).

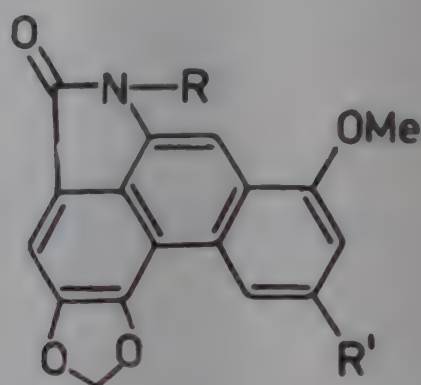
Alcoholic extract of root active against adenocarcinoma 755 in mice (*J. Med. Pharm. Chem.* 1962, 5, 657).

Aristolochic acid, mp. 283° isolated (*J. Pharm. Pharmacol.* 1959, 11, 607; *J. Med. Pharm. Chem.* 1962, 5, 657); aristolochic acid D, its Me ether lactam and aristololactam- β -D-glucoside (*J. Org. Chem.* 1968, 33, 3735); a tetracyclic sesquiterpene - ishwarone - isolated (*Tetrahedron Lett.* 1969, 133).

NEW COMPOUNDS



Aristolochic acid



Aristolochic acid D Me ether lactam

R = H, R' = OMe

Aristololactam- β -D-glucoside

R = Glu, R' = H

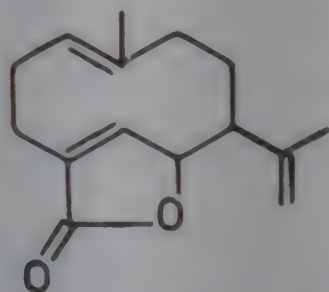
A. longa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 25).

Aristolochic acid, mp. 283° , isolated (*J. Pharm. Pharmacol.* 1959, 11, 607).

A. reticulata Nutt. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 25).

Aristolochic acid, mp. 283° , aristo red, mp. 286° and isorhamnetin obtained (*J. Pharm. Pharmacol.* 1959, 11, 607); a germacranolide - aristolactone - isolated (*Tetrahedron Lett.* 1963, 1639, *ibid*, 1964, 2391).

NEW COMPOUNDS



Aristolactone

A. serpentaria L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 25).

Aristolochic acid and aristo red isolated (*J. Pharm. Pharmacol.* 1959, 11, 607); aristolactone isolated (*Tetrahedron Lett.* 1963, 1639).

ARNICA (Asteraceae)

A. montana L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 25).

Synarine, mp. 224° , 0.017% and 0.07% from flowers and roots respectively (*Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Lekarstv. Aromat. Rast.* 1959, 169; *Chem. Abstr.* 1961, 55, 18894 a);

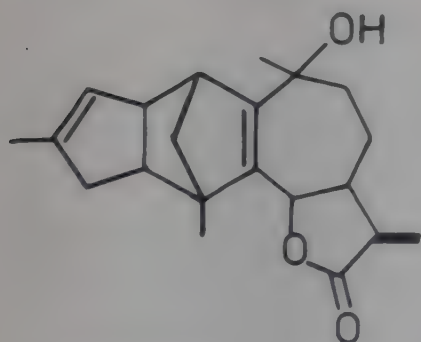
six C-13 polyenes, three phenol ethers, thymol methyl ether, 1-dehydro-4-hydroxythymol dimethyl ether, ϵ -sitosterol and another sterol from root (*Arch. Pharm.* 1963, 296, 273; *Chem. Abstr.* 1964, c0, 3946 d); sterol, mp. 128°, from flowers (*Rocz. Chem.* 1967, 41, 201; *Chem. Abstr.* 1967, 67, 784 s).

ARTEMISIA (Asteraceae)

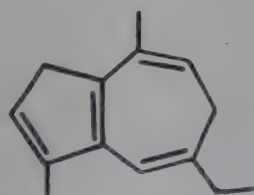
A. absinthium L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 25).

Myrcene, α -pinene, thujyl alcohol, nerol and thujyl acetate isolated from volatile oil (*Akad. Nauk SSSR Tr. Vtoroi Vses. Knof.*, Moscow 1962, 279 (Pub. 1964); *Chem. Abstr.* 1965, 62, 3880 c); chemical studies on artabsin, mp. 131° (*Tetrahedron Lett.* 1968, 3145); two fulvene hydrocarbons isolated and identified as 3,6-dihydrochamazulene and 5,6-dihydrochamazulene (*Tetrahedron* 1968, 24, 2079); structures for artabsin and absinthin proposed (*Tetrahedron Lett.* 1968, 3855); a carbohydrate and 3,4,5-trimethoxybenzoic acid (*Khim. Pri. Soedin.* 1969, 5, 57; *Chem. Abstr.* 1969, 71, 10280 w).

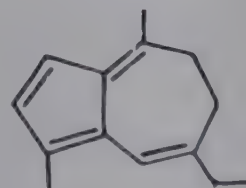
NEW COMPOUNDS



Absinthin



3,6-Dihydrochamazulene



5,6-Dihydrochamazulene

A. annua L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 25).

Camphene, α - and β -pinene, sabinene, α -terpinene, cineole, p-cymole, artemisia ketone, camphor and four unidentified compounds separated from essential oil by GLC (*Rast. Resur.* 1967, 3, 63; *Chem. Abstr.* 1967, 67, 93897 a).

A. dracunculus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 26).

7-Methoxycoumarin, mp. 117°, and 6,7-dimethoxycoumarin, mp. 144° - isolated (*Sci. Pharm.* 1959, 27, 184; *Chem. Abstr.* 1960, 54, 9009 f); capillene and 3-(2-butyryl)isocoumarin from roots (*Chem. Ber.* 1962, 95, 39).

A. fragrans Willd.; see *A. maritima* L.

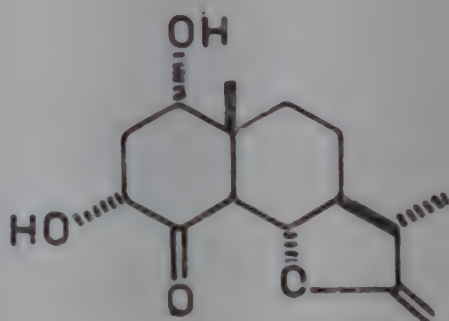
A. gmelini Web ex Stechm. syn. *A. sacrorum* Ledeb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 26).

Umbelliferone and genkwanin isolated (*Curr. Sci.* 1965, 34, 609).

A. maritima L. syn. *A. fragrans* Willd., *A. spicigera* C. Koch. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 26).

Bitter principles are appetite-stimulating (Ger. 35,224 (1965) Feb. 25; *Chem. Abstr.* 1965, 63, 1667 e); an isomer of santonin, mp. 133° , 1,8-cineole and 1-camphor (*Bull. Fac. Med. Istanbul* 1960, 23, 431; *Chem. Abstr.* 1962, 57, 7382 c); a new sesquiterpene lactone - erivanine, mp. 203° - from flower sheaths and leaves (*Zh. Obshch. Khim.* 1963, 33, 1700; *Chem. Abstr.* 1963, 59, 11571 g); lumisantonin, mp. 153° (Jpn. 4147 (1960) Apr. 22; *Chem. Abstr.* 1960, 54, 23213 b); (-)-santonin and (-)- β -santonin (*Eksperim. Bot.* 1965, 5; *Chem. Abstr.* 1966, 65, 12563 c).

NEW COMPOUNDS

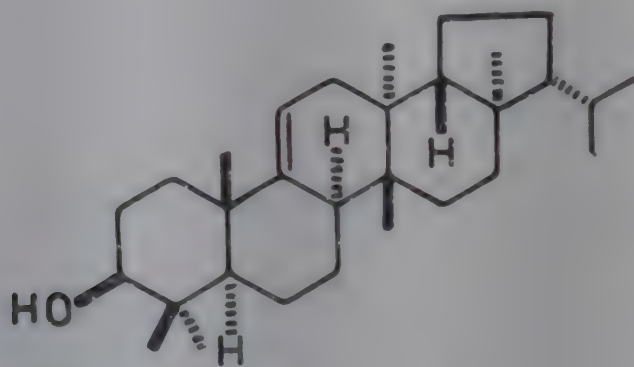


Erivanine

A. nilagirica (Clarke) Pamp. syn. *A. vulgaris* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 26).

Trideca-1,3 5-trien-7,9,11-triyn, artemisia ketone and 1-acetoxytetradeca-4,6-dien-8,10,12-triyn isolated from roots (*Chem. Ber.* 1962, 95, 1733); a pentacyclic triterpene - fernenol, mp. 194° - from rhizomes (*Tetrahedron Lett.* 1966, 1043; *Aust. J. Chem.* 1968, 21, 1931); (-)-thujone, α -amyrin and its acetate, fernenol, stigmasterol and β -sitosterol isolated (*J. Indian Chem. Soc.* 1969, 46, 584).

NEW COMPOUNDS



Fernenol

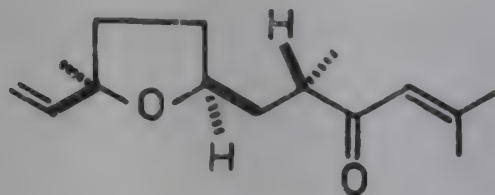
A. pallens Wall. ex DC.

Mar., Tam. & Kan. - Davana

A new sesquiterpenoid ketone - davanone - isolated from oil and identified as 2-methyl-2-vinyl-5-(3-oxo-5-isopropylidene-2-pentyl)-tetrahydrofuran (*Rec. Trav. Chim.* 1968, 87, 715; *Chem. Abstr.* 1968, 69, 59423 t).

Distribution : Karnataka, cultivated elsewhere.

NEW COMPOUNDS

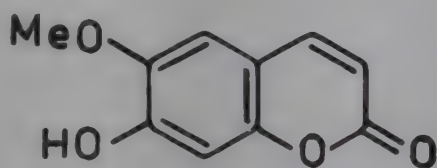


Davanone

A. persica Boiss. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 26)

Scopoletin characterised as 6-methoxy-7-hydroxycoumarin (*Med. Prom. SSSR* 1964, 18, 19; *Chem. Abstr.* 1964, 61, 1710 b).

NEW COMPOUNDS



Scopoletin

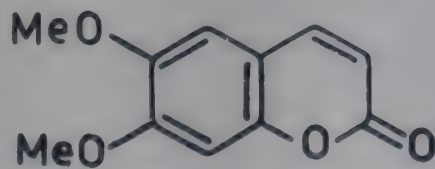
A. sacrorum Ledeb.; see *A. gmelini* Web ex Stechm.

A. scoparia Waldst. & Kit. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 26)

Essential oil used in therapy of urolithiasis (*Dokl. Akad. Nauk. Uz. SSR* 1965, 22, 30; *Chem. Abstr.* 1966, 64, 14023 f).

Scoparone characterised as 6,7-dimethoxycoumarin, mp. 142° (*Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Lekarstv. i Aromat. Rast.* 1959, 11, 177; *Chem. Abstr.* 1961, 55, 17776 b); scoparone from flowers (*Farmatsiya* 1964, 14, 18; *Chem. Abstr.* 1964, 61, 11959 e).

NEW COMPOUNDS



Scoparone

A. sieversiana Ehrh. ex Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 26).

Presence of artabsin, mp. 135°, absinthin, mp 179° and another compound, mp. 156° (*Collect. Czech. Chem. Commun.* 1962, 27, 1508).

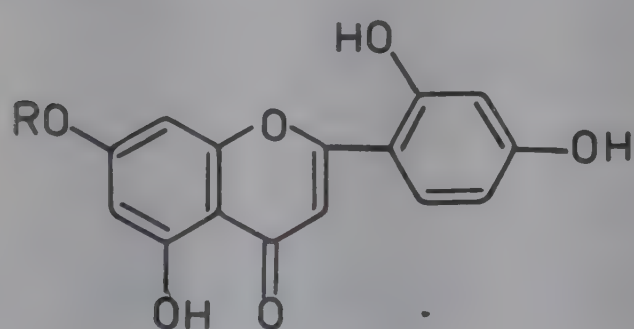
A. spicigera C. Koch.; see *A. maritima* L.

A. vulgaris L.; see *A. nilagirica* (Clarke) Pamp.

ARTOCARPUS (Moraceae)

A. heterophyllus Lam. syn. *A. integrifolia* L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 27).

Artocarpetin, mp. 310° (5,2',4'-trihydroxy-7-methoxyflavone), artocarpanone, mp. 210° (5,2',4'-trihydroxy-7-methoxyflavanone), artocarpin and isoartocarpin from heartwood (*J. Sci. Ind. Res.* 1960, 19B, 470; *ibid.* 1961, 20B, 112; *Tetrahedron Lett.* 1962, 9); cyanomaclurin, mp. 360° , dihydromorin, mp. 228° , artocarpesin, mp. 250° , mixture of morin, cyanomaclurin and norartocarpetin from heartwood (*Tetrahedron Lett.* 1962, 787; *ibid.* 1965, 663); proteins from latex by electrophoretic analysis (*Curr. Sci.* 1965, 34, 212); artocarpin dimethyl ether, isoartocarpin dimethyl ether and dihydrocycloartocarpin from wood (*Beitr. Biochem. Physiol. Naturstoffen Festschr.* 1965, 317; *Chem. Abstr.* 1966, 64, 17563 b); revised structure of cyanomaclurin (*Tetrahedron Lett.* 1966, 5357).

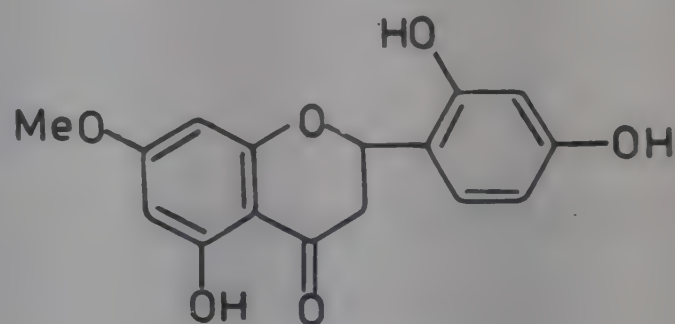
NEW COMPOUNDS

Artocarpetin

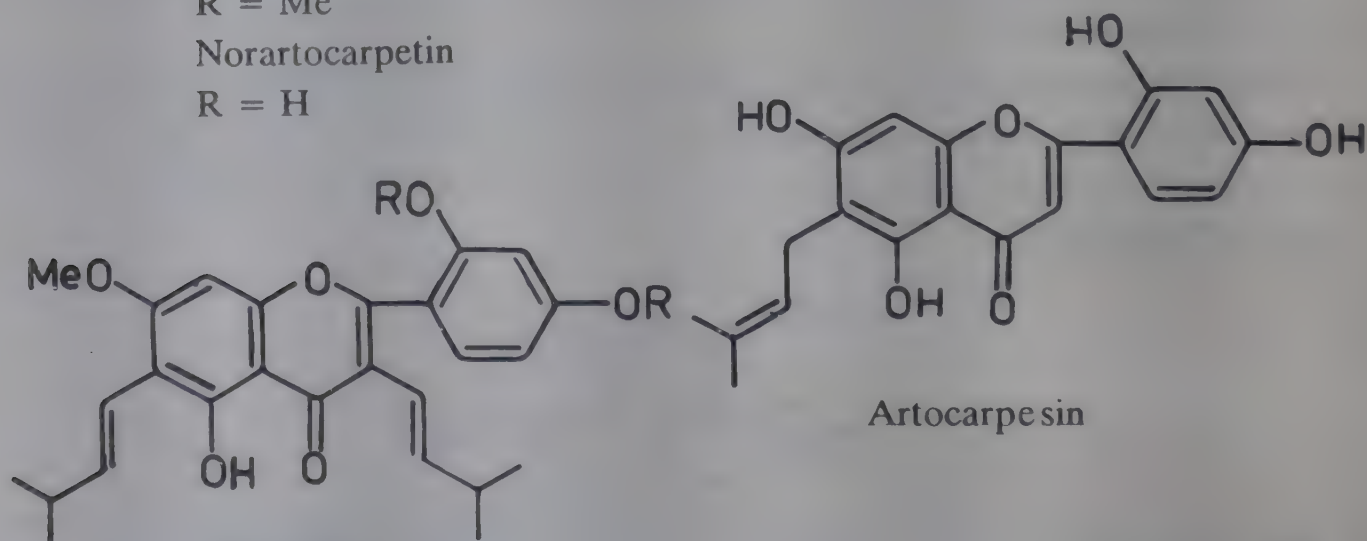
R = Me

Norartocarpetin

R = H



Artocarpanone



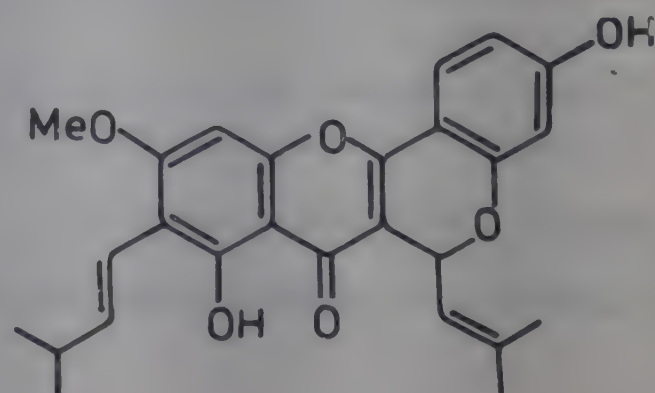
Artocarpesin

Artocarpin

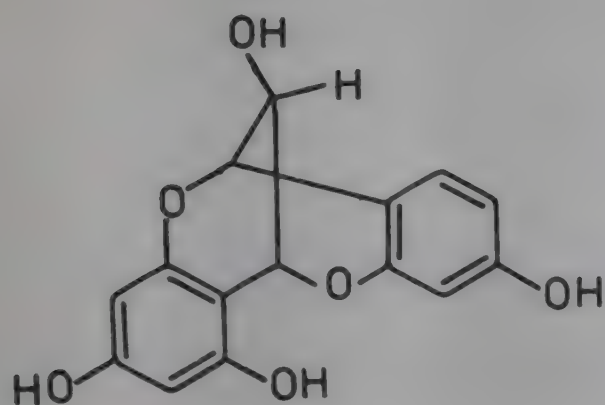
R = H

Artocarpin dimethyl ether

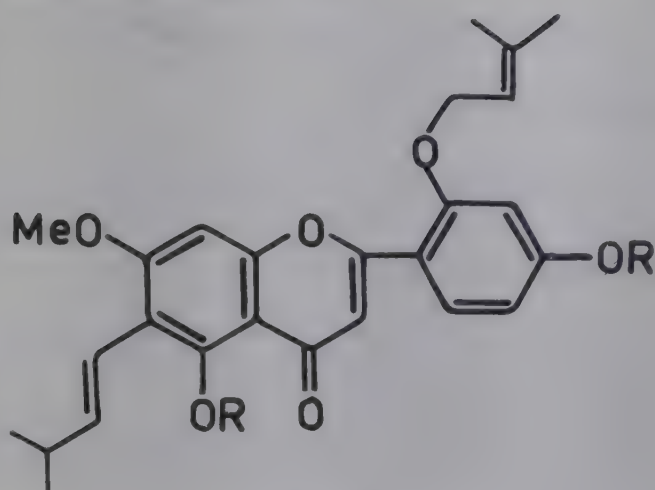
R = Me



Dihydrocycloartocarpin



Cyanomaclurin



Isoartocarpin

R = H

Isoartocarpin dimethyl ether

R = Me

A. integrifolia L.f.; see *A. heterophyllum* Lam.

A. lakoocha Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 27).

Amyrin acetate, mp. 236° and lupeol from stem bark (*J. Sci. Ind. Res.* 1960, 19B, 498); a compound, mp. 161° and lupeol, mp. 213°, (*Bull. Calcutta Sch. Trop. Med.* 1966, 14, 16; *Chem. Abstr.* 1967, 66, 73220 a).

ASARUM (Aristolochiaceae)

A. europeum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 28).

Amino acids - lysine, serine, arginine, aspartic acid, asparagine, glycine, glutamic acid, glutamine, proline, tyrosine, tryptophan, phenylalanine, methionine, valine and histidine - detected in leaves and rhizomes (*Acta Pharm. Hung.* 1965, 35, 20; *Chem. Abstr.* 1965, 63, 2117 f); glucose, fructose and sucrose from leaves and rhizomes (*Pharmazie* 1965, 20, 228; *Chem. Abstr.* 1965, 63, 2117 g); chlorogenic acid (2,3,5-trihydroxy-5-carboxycyclohexyl-3,4-dihydroxycinnamate) and its isomer - isochlorogenic acid - isolated from roots and leaves (*Magy. Kem. Foly.* 1965, 71, 242; *Chem. Abstr.* 1965, 63, 8730 b).

ASPARAGUS (Liliaceae)

A. officinalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 28).

Four flavonoids and rutin isolated from leaves (*Farm. Zh.* 1966, 21, 44; *Chem. Abstr.* 1967, 66, 44249 e).

A. racemosus Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 28).

Quercetin-3-glucuronide, mp. 204°, from leaves (*Curr. Sci.* 1969, 38, 414).

ASTERACANTHA (Acanthaceae)

A. longifolia (L.) Nees; see *Hygrophila auriculata* (K. Schum.) Heine

ATLANTIA (Rutaceae)

A. monophylla (Roxb.) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 30).

A tetranortriterpenoid - atalantin - isolated from root bark (*Indian J. Chem.* 1969, 7, 870).

ATROPA (Solanaceae)

A. belladonna L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 30).

Hyoscyamine (0.72%) and hyoscine isolated from leaves (*Pakistan J. Sci. Ind. Res.* 1961, 4, 245; *Chem. Abstr.* 1962, 57, 14184 g); two flavone glycosides - rutin and kaempferol-3-rhamnogalactoside - from leaves (*Pharm. Acta Helv.* 1963, 38, 119; *Chem. Abstr.* 1963, 59, 5253 f); kaempferol-7-monoglucoside and quercetin-7-monoglucoside from leaves (*Pharm. Acta Helv.* 1964, 39, 450; *Chem. Abstr.* 1964, 61, 2904 f); atropine sulphate, scopolamine HBr, homatropine MeBr and homatropine HBr isolated (*Acta Pharm. Hung.* 1964, 34, 65; *Chem. Abstr.* 1964, 61, 2907 h); atropine (69%) and other alkaloids determined (*Zeszyty Nauk. Univ. Poznaniu, Mat. Fiz. Chem.* 1961, 4, 3; *Chem. Abstr.* 1965, 62, 400 a; *Farmatsiya* 1965, 15, 99; *Chem. Abstr.* 1965, 63, 11249 b).

BIOLOGICAL ACTIVITY :

Atropine inhibited cholinesterase and, thus, in small doses it potentiated toxicity of acetyl choline both in vivo in mice and in vitro on guinea pig ileum (*Nature*, 1962, 193, 1082). Acute toxicity (LD50) and ED50 (convulsions) of optically active isomers of hyoscine and hyoscyamine in mice (i.v.) determined. Dextro and laevo forms of hyoscine and hyoscyamine are equi- active only at toxic dose levels. Quantitative differences in central activity of both isomers at doses far below toxic levels observed either by measuring direct effects or in tests involving drug antagonism in CNS. (-)Hyoscine effective at 0.01 to 0.25 mg/kg and (-)hyoscyamine at 0.04 to 0.4 mg/kg in rats and mice (*Brit. J. Pharmacol.* 1965, 24, 138); metabolism of tropane alkaloids measured by exhalation of C14O2 after i.p. injection in mice (*Planta Med.* 1961, 9, 293).

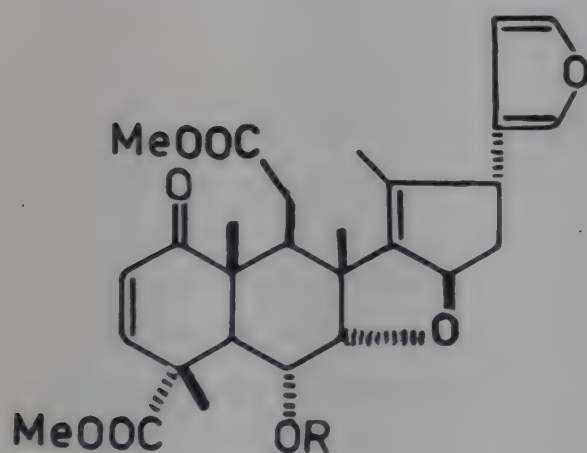
AZADIRACHTA (Meliaceae)

A. indica (L.) A. Juss. syn. *Melia azadirachta* L. (*Glossary Indian Med Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 31).

Therapeutic and chemical properties of margosa oil and margosa extract described. Oil contains bitter substances - nimbin, mp. 192°, nimbidin, mp. 90° and nimbidol (*Seifen - Oele-Fette-Wachse* 1963, 59, 894; *Chem. Abstr.* 1965, 63, 5449 b); a paraffin alcohol - sugiol and a new oxophenol - nimbiol, mp. 250° - in addition to known nimbosterol, mp. 82°, from trunk

bark (*Tetrahedron* 1960, 10, 45); structure of nimbin, mp. 204°, elucidated; nimbidic acid, mp. 259°, isolated (*Tetrahedron* 1960, 11, 67; *Chem Ind.* 1964, 322); synthesis of degradation products of nimbiol (*J. Sci. Ind. Res.* 1962, 21, 50; *J. Org. Chem.* 1975, 40, 3686); tetranortriterpenoids - epoxyazadiradione, mp. 199°, azadiradione and azadirone - from seed oil (*Chem. Commun.* 1967, 278); a new meliacin - nimbolide, mp. 245° - from leaves (*Chem. Commun.* 1967, 808); meliantriol, 176°, from seed oil (*Chem. Commun.* 1967, 910); deacetylnimbin mp. 208° from seed and bark (*Indian J. Chem.* 1967, 5, 460); quercetin and β -sitosterol from leaves (*J. Indian Chem. Soc.* 1968, 45, 466); cyclolucalenol, mp. 135°, 24-methylenecycloartanol, mp. 115° and β -sitosterol isolated from wood oil of West African tree (*Chem. Ind.* 1968, 1808); a new tetranortriterpenoid - meldenin, mp. 240° - from seed oil (*Tetrahedron Lett.* 1968, 437); nimbolin A, mp. 180°, and nimbolin B, mp. 243°, isolated from trunk wood (*Chem. Commun.* 1969, 1166); vipinin from oil (*Indian J. Chem.* 1969, 7, 187).

NEW COMPOUNDS

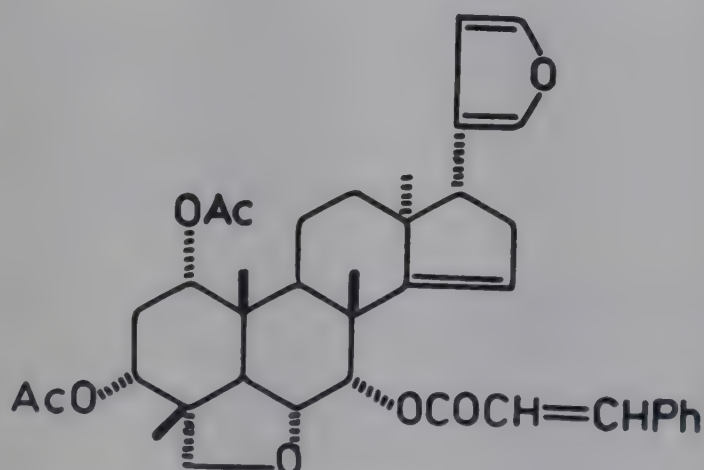


Nimbin

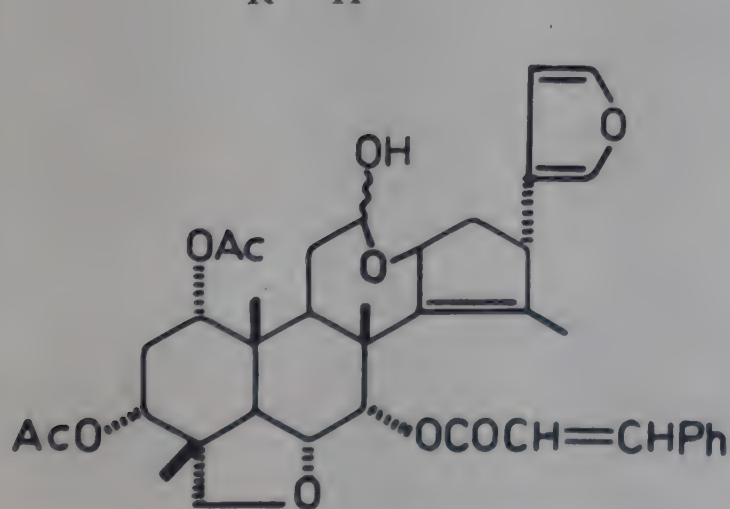
R = Ac

Deacetylnimbin

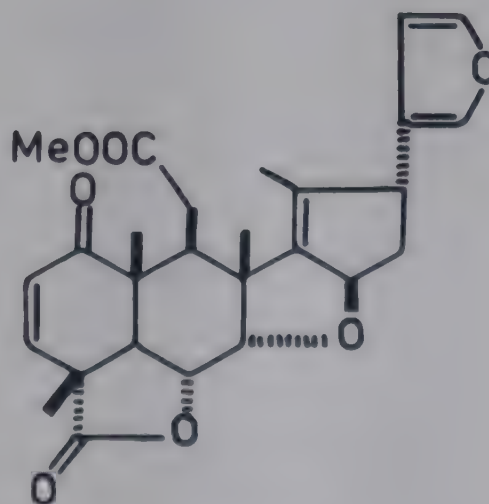
R = H



Nimbolin A



Nimbolin B



Nimbolide

02261

PK 435

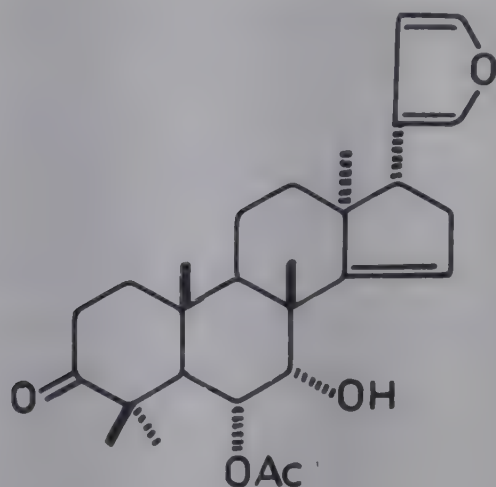
COMMUNITY HEALTH CELL

326, V Main, 1 Block

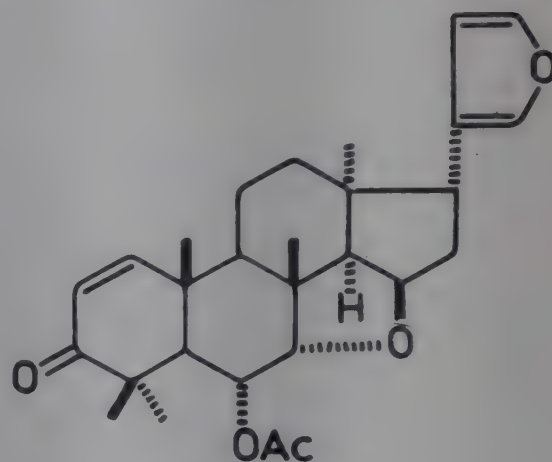
Koramangala

Bangalore - 560034

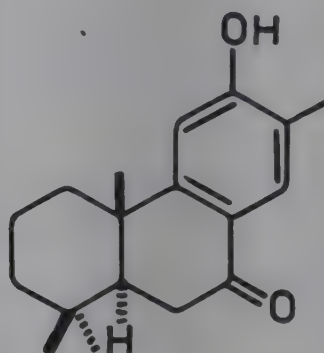
12312



Meldenin



Vipinin

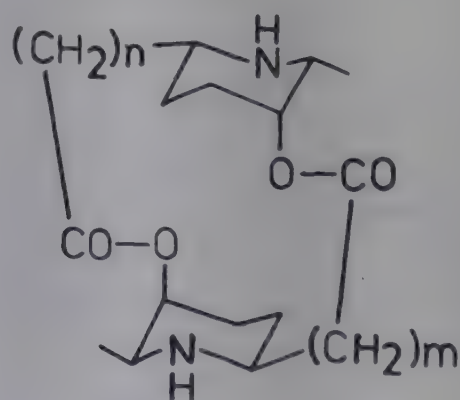


Nimbiol

AZIMA (Salvadoraceae)

A. tetracantha Lam. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, 32).

New alkaloids - azimine, mp. 112°, azcarpine and carpaine, mp. 117° - isolated from leaves (*Tetrahedron Lett.* 1967, 3465).

NEW COMPOUNDS

Azimine

$n, m = 5$

Azacarpine

$n = 5, m = 7$

Carpaine

$n, m = 7$

BACCAUREA (Euphorbiaceae)*B. sapida* (Roxb.) Muell.-Arg.

H. - Lotka

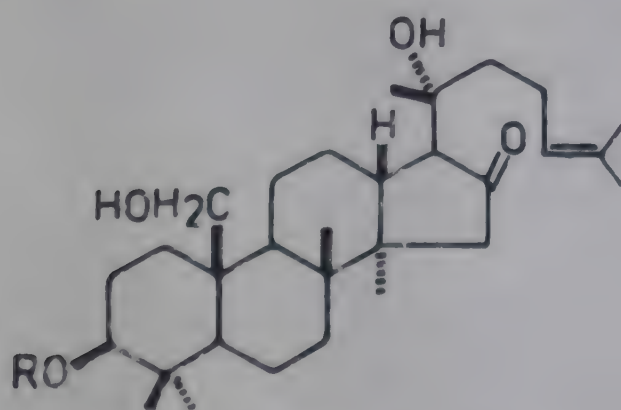
Friedelin and epifriedelinol from bark (*J. Indian Chem. Soc.* 1967, 44, 728).

Distribution : Sub-Himalayan tracts, Assam and Andamans, wild or cultivated.

BACOPA (Scrophulariaceae)*B. monnieri* (L.) Wettst. syn. *Herpestis monniera* (L.) H. B. & K. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 32).

Total alkaloidal fraction, LD₅₀ 8.5 mg/100g in mice (i.p.), stimulated autonomic ganglia followed by blockade, produced spasm of the skeletal muscle, stimulated respiration followed by depression, showed tachyphylaxis and produced rigidity and convulsions in mice (*Indian J. Physiol. Pharmacol.* 1961, 5, 136); behavioural effects of active fraction suggested that it had tranquillising property which was much weaker than that of chlorpromazine. It did not block significantly conditioned avoidance response in rats even at high doses but offered graded protection against audiogenic seizure in mice and antagonised mescaline scratch response in mice (*Indian J. Med Res.* 1967, 55, 473).

An amorph. substance, mp. 71°, betulinic acid, D-mannitol, and a glycoside, mp. 275°, containing glucose and arabinose, isolated (*J. Sci. Ind. Res.* 1960, 19B, 455; *J. Chem. Soc.* 1960, 2783); two saponins - bacoside A, mp. 250° and bacoside B, mp. 203° - stigmastenol, β -sitosterol, stigmasterol in addition to mannitol and betulinic acid isolated (*Indian J. Chem.* 1963, 1, 212); structures of bacoside A and bacoside B assigned as 3-(α -L-arabinopyranosyl)-O- β -D-glucopyranoside-10,20-dihydroxy-16-keto-dammar-24-ene; these differ only in optical rotation (*Indian J. Chem.* 1965, 3, 24; *ibid.* 1967, 5, 84); another saponin- monnierin - isolated and its structure assigned (*Indian J. Chem.* 1963, 1, 408; *ibid.* 1968, 6, 471); nicotine detected by PC in alcoholic extract (*Indian J. Physiol. Pharmacol.* 1961, 5, 136).

NEW COMPOUNDS

Bacoside A

R = Glu-Ara

BIOLOGICAL ACTIVITY

Hersaponin mainly exhibited sedative action in mice (i.p.). It did not protect rats against

electric shock or mice against metrazole seizures nor did it diminish metrazole toxicity. It reduced amphetamine toxicity in mice. It potentiated hypnotic effects of hexobarbital, pentobarbital and EtOH in mice; maximum potentiation observed when it was administered 15 min. prior to other compounds (*Arch. Int. Pharmacodyn. Ther.* 1960, 129, 290; *Chem. Abstr.* 1961, 55, 15748 a).

BALANITES (Balanitaceae)

B. aegyptiaca (L.) Delile syn. *B. roxburghii* Planch. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 32).

A steroidal saponin - balanitesin, mp. 182° - composed of diosgenin, glucose, xylose and rhamnose from seed kernels (*Arch. Pharm.* 1962, 295, 401; *Chem. Abstr.* 1962, 57, 15238 d).

B. roxburghii Planch.; see *B. aegyptiaca* (L.) Delile

BALSAMODENDRON (Burseraceae)

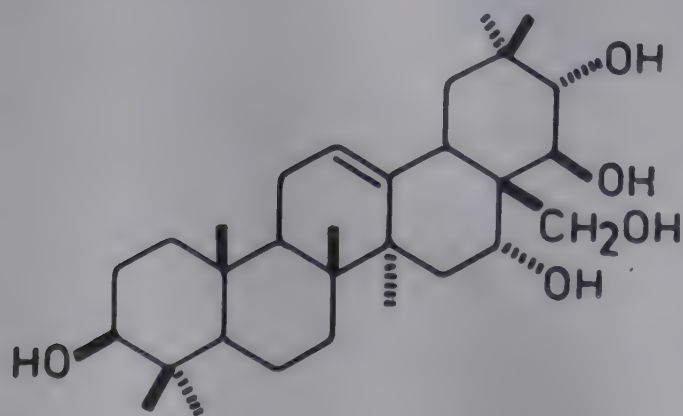
B. mukul Hook. ex Stocks; see *Commiphora wightii* (Arnott) Bhandari

BARRINGTONIA (Barringtoniaceae)

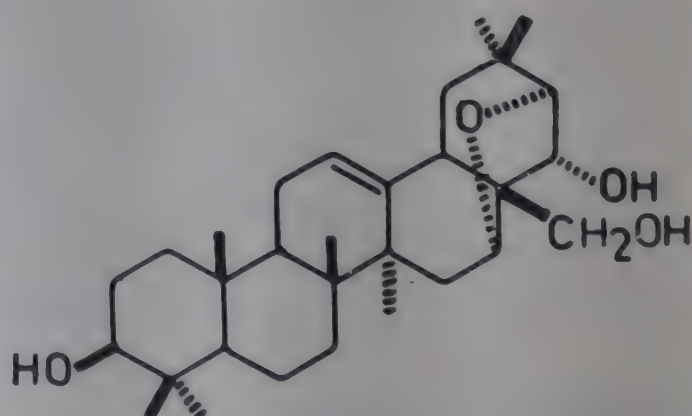
B. acutangula (L.) Gaertn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 34).

Barringtogenol D characterised as 3 β ,22 α ,28-trihydroxy-16 α , 21 α -oxidoolean-12-ene, mp. 233°, from fruits (*Experientia* 1962, 18, 66; *Tetrahedron* 1963, 19, 1727); barringtogenol C characterised as 3 β ,16 α ,21 α ,22 β ,28-pentahydroxyolean-12-ene (*J. Indian Chem. Soc.* 1963, 40, 483; *Tetrahedron* 1965, 21, 381); β - and γ -sitosterols, a triterpene alcohol - tanginol, mp. 283° - and a triterpene dicarboxylic acid isolated from heartwood; barringtonic acid, mp. 285°, after acid hydrolysis of alcoholic extractive (*Indian J. Chem.* 1963, 1, 322; *ibid.* 1964, 2, 463; *Tetrahedron* 1967, 23, 3837); barringtogenol E mp. 221°, [3 α ,16 α ,28-trihydroxy-21 β ,22 α -bis(benzoyloxy)-olean-12-ene] from branch wood (*J. Indian Chem. Soc.* 1967, 44, 991; *Trans. Bose Res. Inst.* 1967, 30, 45; *Chem. Abstr.* 1969, 70, 44849 n); barringtogenol B (3 β ,21 β ,22 α ,28-tetrahydroxy-16 α -angeloyloxyolean-12-ene) (*Tetrahedron* 1968, 24, 1113); 2 α ,3 α , 19-trihydroxyolean-12-en-23,28-dioic acid (I) from branch wood (*Sci. Cult.* 1968, 34, 259).

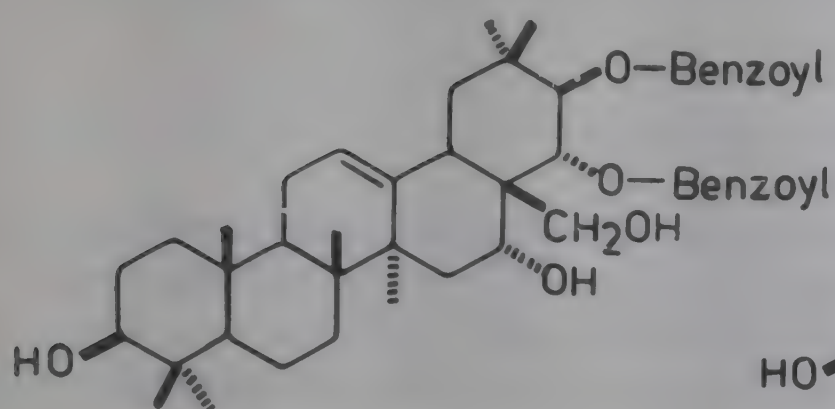
NEW COMPOUNDS



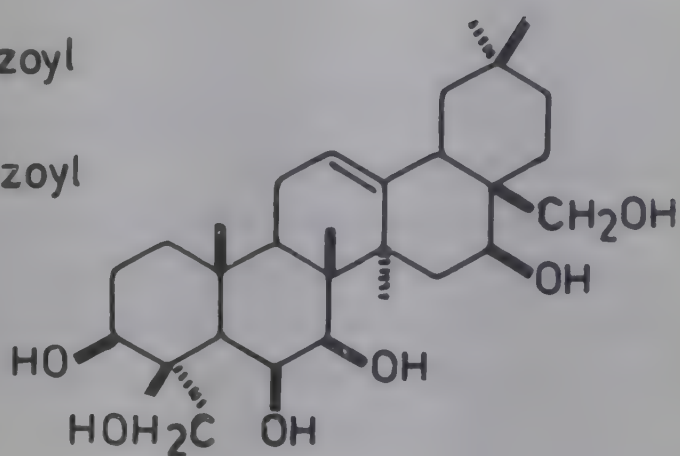
Barringtogenol C



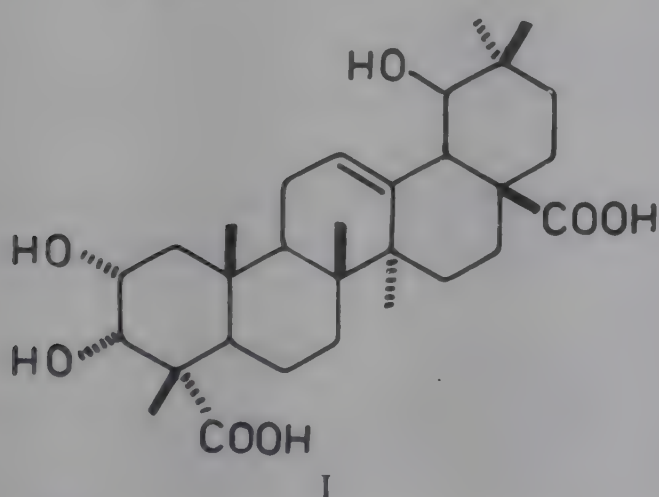
Barringtogenol D



Barringtonol E



Tanginol



I

B. racemosa (L.) Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 34).

A new saponin - barringtonin - composed of rhamnose and barringtonol, mp. 290°, from fruits (*Bull. Res. Inst. Univ. Kerala*, Ser. A 1959, 6, 15; *Chem. Abstr.* 1960, 54, 16746 f).

BARTSIA (Scrophulariaceae)

B. odontites Hook.f.; see *Odontites serotina* (Lamk) Dum.

BASSIA (Sapotaceae)

B. butyracea Roxb.; see *Madhuca butyracea* (Roxb.) Machride

B. latifolia Roxb.; see *Madhuca longifolia* (Koen.) Machride

BAUHINIA (Caesalpiniaceae)

B. purpurea L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 35).

Isoquercitrin, mp. 220°, astragalin, mp. 176° and quercetin identified in extract of fresh flowers (*Curr. Sci.* 1967, 36, 574).

B. tomentosa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 35).

Isoquercitrin (quercitrin-3-glucoside) along with quercetin from flowers (*Indian J. Chem.* 1963, 1, 450).

BEAUMONTIA (Apocynaceae)

B. grandiflora (Roxb.) Wall.

Seed extract showed presence of 12 cardenolides by PC; six cardenolides including 3 new substances - walloside, mp. 193°, beaumontoside, mp. 202° and beauwalloside, mp. 223° - isolated (*Pharm. Acta Helv.* 1964, 39, 168; *Chem. Abstr.* 1964, 61, 7361 h).

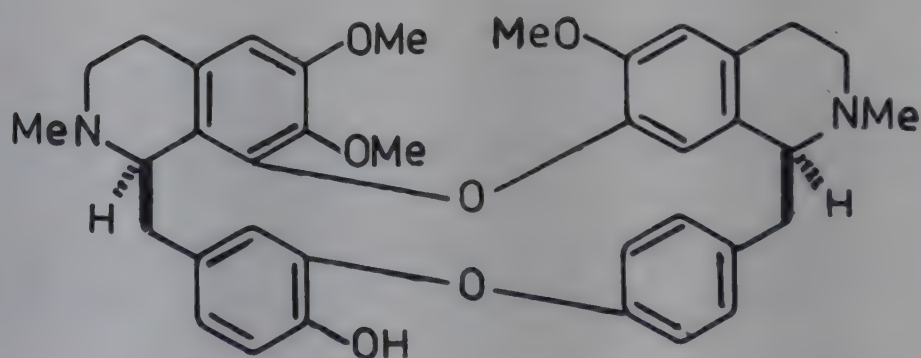
Distribution : Himalayas from Nepal to Sikkim, ascending to 1200 m. Often grown in gardens as ornamental.

BERBERIS (Berberidaceae)

B. lycium Royle (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 36).

Three new alkaloids - berbenine, mp. 152°, berbericine hydrochloride, mp. 199° and berbericinine hydroiodide, mp. 205° - isolated from roots (*Pakistan J. Sci. Ind. Res.* 1966, 9, 343; *Chem. Abstr.* 1968, 68, 13233 g).

NEW COMPOUNDS



Berbenine

BIOLOGICAL ACTIVITY

Berbenine showed depressant action on isolated rabbit heart. 5 mg/kg and 10mg/kg. i.v. produced acute fall in blood pressure in dogs (*Pakistan J. Sci. Ind. Res.* 1967, 10, 34; *Chem. Abstr.* 1968, 68, 20805 y).

B. pachycantha Koehne syn. *B. thunbergii* DC.

Oxyacanthine, mp. 212°, berbamine, mp. 124°, oxyberberine, mp. 200°, isotetrandrine, mp. 180°, jatrorrhizine, mp. 217°, magnoflorine iodide, mp. 228°, isolated (*Yakugaku Zasshi* 1960, 80, 845; *Chem. Abstr.* 1960, 54, 23187 h).

Distribution : North-western Himalayas.

B. petiolaris Wall. ex G. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 36).

Roots used in folk medicine for diuresis and relief of various ailments.

Berberine, berbericine and a new more polar alkaloid isolated as picrate, mp. 160°, from

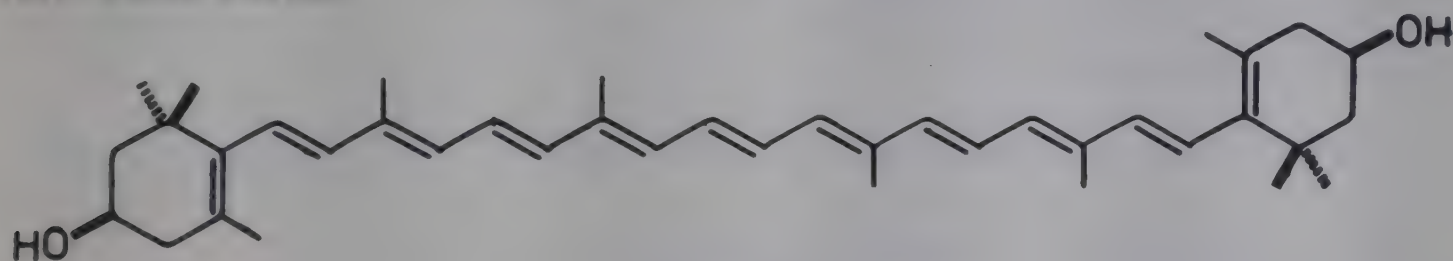
roots (*Sci. Res.* 1968, 5, 75; *Chem. Abstr.* 1968, 69, 61516 u).

B. thunbergii DC.; see *B. pachycantha* Koehne

B. vulgaris L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 36).

Carotenoids - α - and β -carotenes - lutein, zeaxanthin, chrysanthemaxanthin, flavoxanthin, auroxanthin and capsanthin identified in berries (*Ann. Univ. Mariae Curie - Sklodowska, Lublin-Polonia* 1959, 14C, 383; *Chem. Abstr.* 1961, 55, 22498 f).

NEW COMPOUNDS



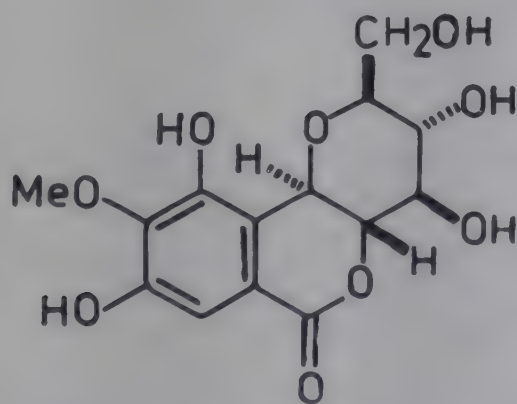
Zeaxanthin

BERGENIA (Saxifragaceae)

B. ciliata (Haw.) Sternb. forma *ligulata* Yeo syn. *B. ligulata* (Wall.) Engl., *Saxifraga ligulata* Wall. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 37).

Bergenin, mp. 237°, from roots (*J. Indian Chem. Soc.* 1962, 39, 559).

NEW COMPOUNDS



Bergenin

B. ligulata (Wall.) Engl.; see *B. ciliata* (Haw.) Sternb forma *ligulata* Yeo

BETULA (Betulaceae)

B. utilis D. Don. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 37).

Betulin, lupeol, oleanolic acid, acetyl oleanolic acid and leucocyanidin from bark (*Indian J. Chem.* 1968, 6, 231).

BIDENS (Asteraceae)

B. tripartita L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956,

p. 37).

Five polyacetylenic compounds from roots (*Chem. Ber.* 1962, 95, 1315); luteolin, mp. 222° and its glucoside (*Acta Pol. Pharm.* 1963, 20, 357; *Chem. Abstr.* 1965, 62, 1510 c).

BIGNONIA (Bignoniaceae)

B. adenophylla Wall. ex G. Don see *Fernandoa adenophylla* (Wall. ex G. Don) V. Steenis

BIOTA (Cupressaceae)

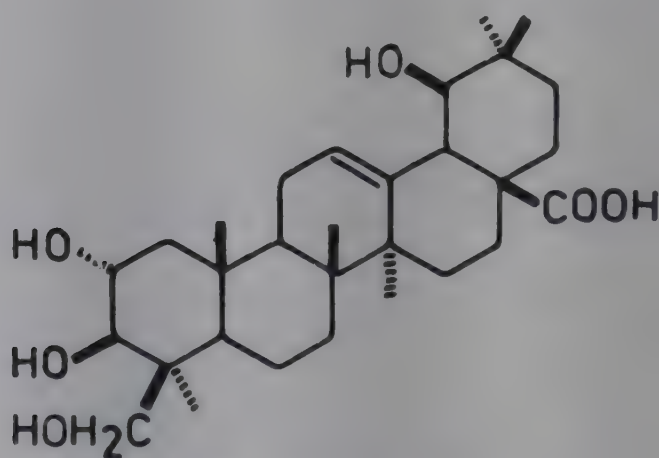
B. orientalis Endl.; see *Thuja orientalis* L.

BIXA (Bixaceae)

B. orellana L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 37).

Tomentosic acid isolated (*J. Org. Chem.* 1965, 30, 2856).

NEW COMPOUNDS



Tomentosic acid

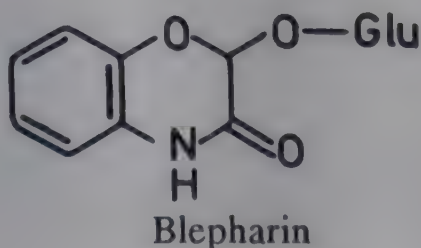
BLEPHARIS (Acanthaceae)

B. edulis Pers.; see *B. persica* (Burm.) O. Kuntze

B. persica (Burm.) O. Kuntze syn. *B. edulis* Pers. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 38).

An isocoumarin glucoside - blepharin, mp. 226° - from seeds (*Chem. Ind.* 1969, 328.).

NEW COMPOUNDS



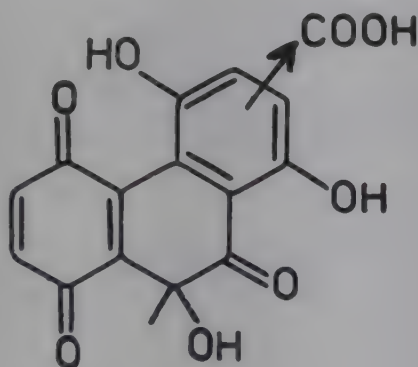
Blepharin

BLIGHIA (Sapindaceae)*B. sapida* Koen. & Sims

Eng. - Arkee

Hederagenin, mp. 325°, from husks (*J. Chem. Soc.* 1963, 744); palmitic, palmitoleic, stearic, oleic, linoleic, arachidonic, behenic and erucic acids detected by GLC in seed oil (*Oleagineux* 1964, 19, 563; *Chem. Abstr.* 1965, 62, 4324 d); blighinone, mp. 360° dec., stigmasterol, a fructoside, mp. 296°, from pericarp of fresh fruits; a saponin composed of glucose, rhamnose, arabinose, xylose and a genin from husk (*Planta Med.* 1967, 15, 74); structure of blighinone (*Tetrahedron Lett.* 1968, 1549); glycylglycine, diglycylglycine, glycyl-L-alanine and γ -L-glutamyl-trans- α -L-(carboxycyclopropyl)glycine from seeds (*Phytochemistry* 1969, 8, 1043).

Distribution : Native of West Africa, occasionally found in cultivation.

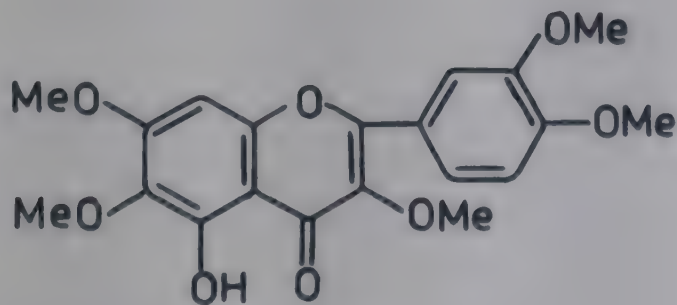
NEW COMPOUNDS

Blighinone

BLUMEA (Asteraceae)

B. eriantha DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 38).

Structure of erianthin revised to 5-hydroxy-3,3',4',6,7-pentamethoxyflavone (*J. Indian Chem. Soc.* 1968, 45, 851).

NEW COMPOUNDS

Erianthin

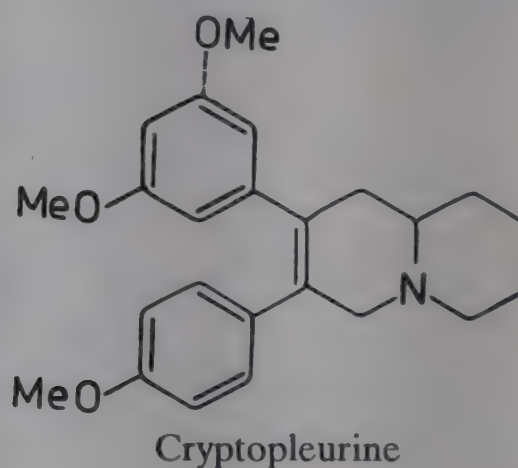
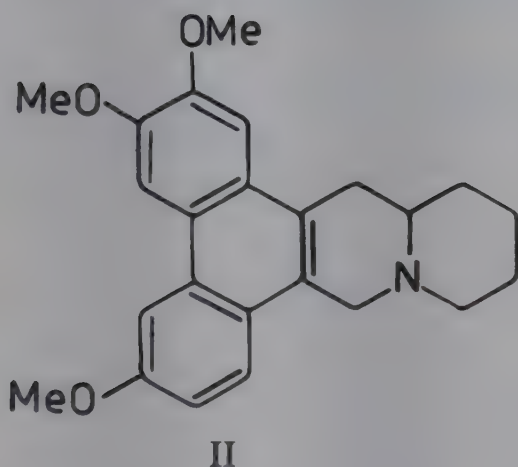
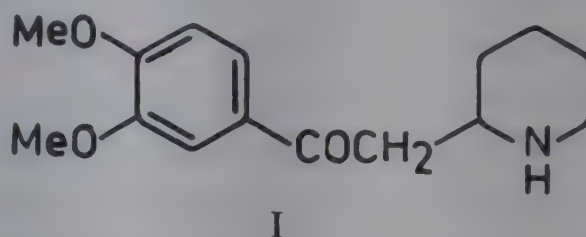
BOEHMERIA (Urticaceae)*B. platyphylla* D. Don

H. - Siar.

A new alkaloid - 3,4-dimethoxy- ω -(2'-piperidy)acetophenone (I) - along with minor alkaloids - cryptopleurine and a secophenanthroquinolizidine (II) (*Aust. J. Chem.* 1968, 21, 1397, 2579).

Distribution : Tropical and subtropical Himalayas from Simla eastwards ascending to 2100 m. Bihar and Travancore.

NEW COMPOUNDS



BOENNINGHAUSENIA (Rutaceae)

B. albiflora (Hook.) Reichb. ex Meissn.

Rutin, mp. 188° (*Kyoto Yakka Daigabu* 1962, 10, 17; *Chem. Abstr.* 1964, 60, 3264 b); bergapten (0.0015%) and dictamnine (0.0006%) from leaves and stems of Japanese variety; a lactone, mp. 267°, from leaves (*Chem. Pharm. Bull.* 1964, 12, 1232).

Distribution : Himalayas, from Kashmir to Bhutan, ascending to 2400 m., Khasi Hills 1200 to 1800 m.

BOERHAVIA (BOERHAAVIA) (Nyctaginaceae)

B. diffusa L. syn. *B. repens* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 39).

Ash (11.8), Ca (1.2) and K (2.3%), presence of alkaloids, free and combined amino acids determined in aerial parts of plant. Similar comparative studies showed them to be different in *B. erecta* L. syn. *B. punamava* Saha & Murthy (note: *B. punamava* Spec. Nov. is to be read accordingly) (*Indian J. Pharm.* 1965, 27, 41).

B. repens L.; see *B. diffusa* L.

BOMBAX (Bombacaceae)

B. ceiba L. syn. *Salmalia malabarica* Schott & Endl., *Bombax malabaricum* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 218).

Hydrolysis of gum yielded arabinose, galactose, galacturonic acid and traces of rhamnose; partial hydrolysis gave 6-O-(β -D-galactopyranosyl-uronic acid)-D-galactopyranose (*J. Indian Chem. Soc.* 1963, 40, 257); 2,3,4,6-tetra-, 2,6-di- and 2,4-di-O-methyl-O-D-galactose and 2,3,5-tri- and 2,5-di-O-methyl-L-arabinose identified as hydrolytic products of methylated gum (*J. Indian Chem. Soc.* 1965, 42, 367); calyx contained moisture (85.66), crude protein (1.38), carbohydrate (11.95) and ash (1.09%); Ca, P and Mg contents of ash determined (*Sci. Cult.* 1965, 31, 189).

B. malabaricum DC., see *B. ceiba* L.

BONGARDIA (Berberidaceae)

B. chrysogonum (L.) Spach syn. *B. rauwolfii* C.A. Mey (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 39).

An alkaloid - leonticine, mp. 118° - from tubers (*Qualitas Plant. Mater. Vegetabiles* 1963, 9, 381; *Chem. Abstr.* 1964, 60, 9599 d).

B. rauwolfii C.A. Mey; see *B. chrysogonum* (L.) Spach

BOSWELLIA (Burseraceae)

B. serrata Roxb. ex Coleb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 39).

Carbohydrates, glucosides and β -sitosterol from bark (*Indian For. Leaflet* 1965, 7, 175; *Chem. Abstr.* 1965, 63, 16772 f).

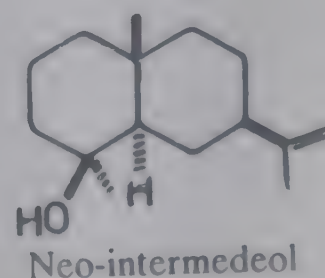
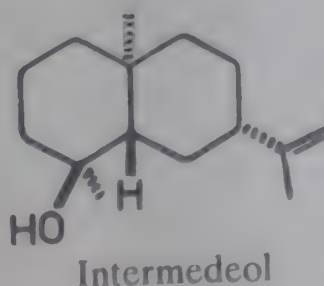
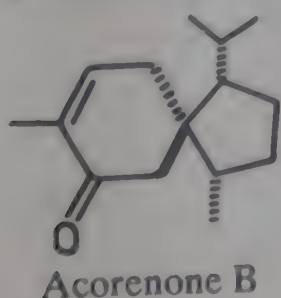
BOTHRIOCHLOA (Poaceae)

B. intermedia (R. Br.) A. Camus syn. *Andropogon intermedius* R.Br.

H. - Sandhor, Khar, Jhara; B. - Sudugan

A sesquiterpene alcohol - intermedeol, mp. 47° (*Chem. Ind.* 1963, 38); neo-intermedeol, bp. 85° (*Chem. Ind.* 1964, 194); comparison of essential oil content of wild and cultivated plants (*Soap Perfum. Cosmet.* 1967, 40, 413; *Chem. Abstr.* 1967, 67, 93899 w); configuration of acorenone B established (*Chem. Commun.* 1968, 1135).

Distribution : Throughout plains of India, ascending to 2400 m. in Western Himalayas.

NEW COMPOUNDS

BOUCEROSIA (Asclepiadaceae)

B. aucheriana Decne.; see *Caralluma tuberculata* N.E. Brown

BRASSICA (Brassicaceae)

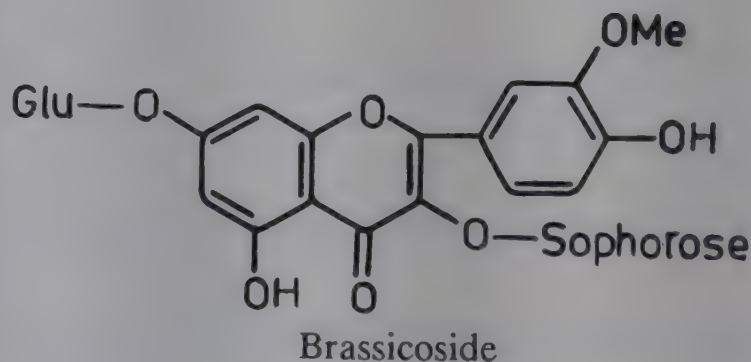
B. campestris L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 40).

Rutin in seeds (*Bull. Soc. Pharm. Nany* 1960, 21; *Chem. Abstr.* 1961, 55, 3744 a).

B. campestris L. ssp. *napus* (L.) Hook.f. & Thoms.; see *B. napus* L.

B. napus L. syn. *B. campestris* L. ssp. *napus* (L.) Hook.f. & Thoms. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 40).

A flavonol glycoside - brassicoside, mp. 209° - characterised as isorhamnetin-3-β-[2-O-β-glucopyranosyl-D-glucoside] from flowers (*Chem. Ber.* 1967, 100, 2301); epi-progoitrin, the major thioglucoside of seeds, was cleaved by ferrous salts to yield (S)-1-cyano-2-hydroxy-3 butene and (S)-3-hydroxypent-4-enthionamide (*Can. J. Chem.* 1968, 46, 1507).

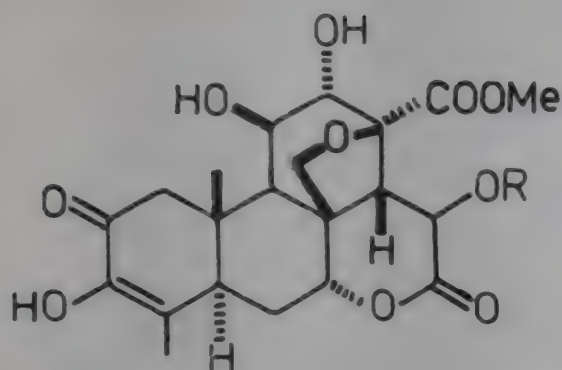
NEW COMPOUNDS**BRUCEA** (Simaroubaceae)

B. amarissima (Lour.) Merr.; see *B. javanica* (L.) Merr.

B. javanica (L.) Merr. syn. *B. amarissima* (Lour.) Merr., *B. sumatrana* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 41).

Bruceine A, bruceine B and bruceine C and brusatol from seeds (*Experientia* 1967, 23, 424; *J. Org. Chem.* 1968, 33, 429); a lactone, mp. 258°, from non-lipophilic portion of seeds (*Tetrahedron Lett.* 1968, 6007); bruceine D and bruceine G, mp. 254°, from seeds (*Experientia* 1968, 24, 768); structure elucidation of bruceine F (*C.R. Acad. Sci. Paris, Ser. C* 1969, 268, 1392; *Chem. Abstr.* 1969, 71, 49701 j).

NEW COMPOUNDS



Bruceine A

R = Isovaleryl

Bruceine B

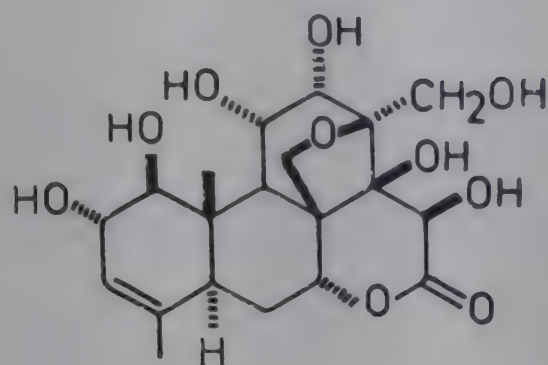
R = Ac

Bruceine C

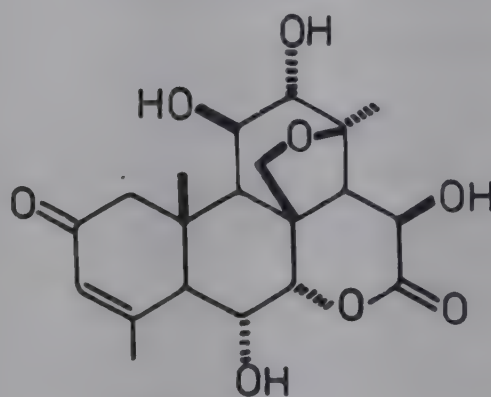
R = $\text{COCH}=\text{C}(\text{Me})\text{C}(\text{OH})\text{Me}_2$

Brusatol

R = Senecieryl



Bruceine F



Bruceine G

B. sumatrana Roxb., see *B. javanica* (L.) Merr.

BRUNIFELSIA (Solanaceae)

B. hopeana Benth.

Scopoletin from seeds (*Anais Acad. Bras. Cienc.* 1964, 36, 511; *Chem. Abstr.* 1966, 64, 1007 b).

Distribution : Native of Brazil and West Indies. Grown in gardens as ornamental.

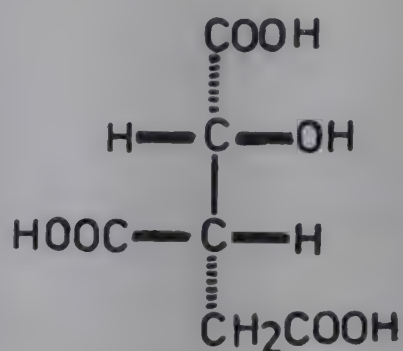
BRYOPHYLLUM (Crassulaceae)

B. calycinum Salisb.; see *B. pinnatum* (Lam.) Oken

B. pinnatum (Lam.) Oken syn. *Kalanchoe pinnata* Pers., *Bryophyllum calycinum* Salisb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 147).

Structure and absolute configuration of isocitric acid (*Chem. Ind.* 1960, 1187, 1188; *J. Am. Chem. Soc.* 1962, 84, 309).

NEW COMPOUNDS



Isocitric acid

BUDDLEJA (BUDDLEIA) (Buddlejaceae)

B. asiatica Lour.; see *B. neemda* Ham. ex Roxb.

B. neemda Ham. ex Roxb. syn. *B. asiatica* auct. (non Lour.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 42).

Quercetin and linarin (acacetin-7-rutinoside) from flowers (*Indian J. Chem.* 1963, 1, 366).

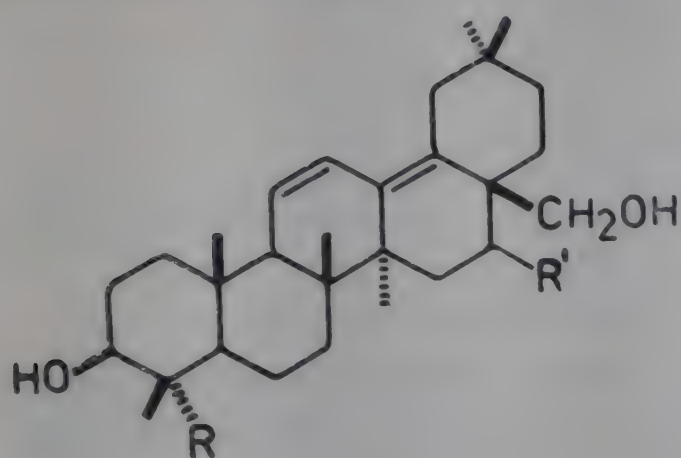
BUPLEURUM (Apiaceae)

B. falcatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 42).

Roots used as important drug in Chinese medicine.

Angelicin, mp. 138°, from roots (*Nippon Kagaku Zasshi* 1964, 85, 558; *Chem. Abstr.* 1965, 63, 3314 e); saponins - saikosides Ia, Ib and II - from roots and seeds; saikogenin A, mp. 283°, is major sapogenin of saponins Ia and Ib (*Tetrahedron Lett.* 1965, 3783; *Chem. Pharm. Bull.* 1966, 14, 1023); acid hydrolysis of root saponins gives longispinogenin and a new triterpenoid triol - saikogenin B. (*Tetrahedron* 1967, 23, 3353); saikogenins A, C, D obtained by hydrolysis of root saponins, characterised (*Tetrahedron* 1967, 23, 3333); saikogenin E, mp. 289°, obtained from saikoside II, the main saponin of root (*Tetrahedron Lett.* 1966, 4721; *ibid.* 1966, 4725; *Chem. Pharm. Bull.* 1968, 16, 641); saikogenins D and F regarded as genuine sapogenins isolated from root saponin (*Tetrahedron Lett.* 1966, 5045); saponins from plant consisted of saikosaponins a, c and d; structures of saikosaponins a, mp. 225° and d, mp. 212° elucidated as 3-[-O-β-D-glucopyranosyl-(1→3)]-β-D-fucopyranosides of saikogenins F and G respectively; saikosaponin c, mp. 202°, defined as 3-[O-β-D-glucopyranosyl-(1→6)-[O-α-L-rhamnopyranosyl-(1→4)]-β-D-glucopyranoside of saikogenin E (*Tetrahedron Lett.* 1968, 303; *Tetrahedron* 1968, 24, 675).

NEW COMPOUNDS



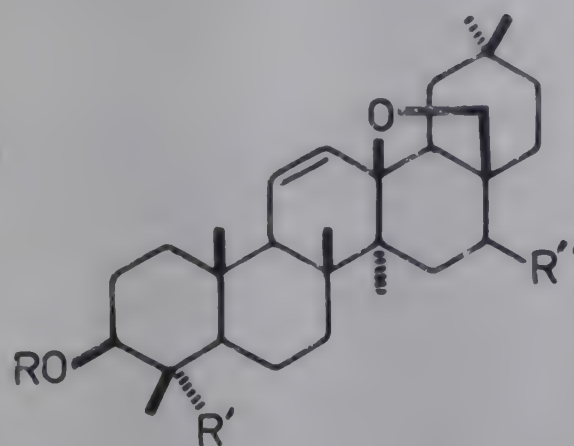
Saikogenin A

R = CH₂OH, R' = β-OH

Saikogenin C

R = Me, R' = β-OH

Saikogenin D

R = CH₂OH, R' = α-OH

Saikosaponin a

R = Fuc.(3→1)Glu, R' = CH₂OH

R'' = β-OH

Saikosaponin b

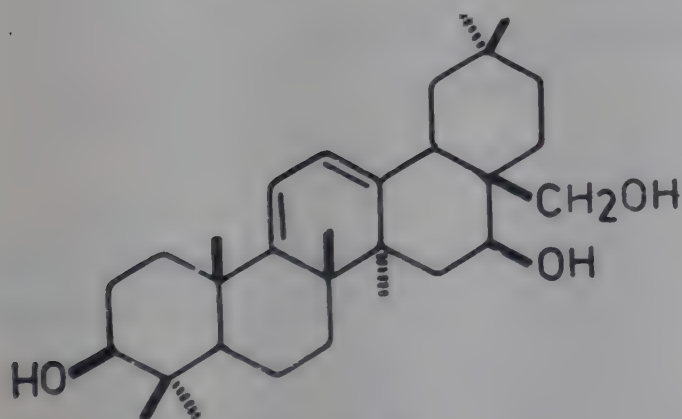
R = Fuc(3→1)Glu,

R' = CH₂OH, R'' = α-OH

Saikosaponin c

R = Glu[(4→1)Rha](6→1)Glu,

R' = Me, R'' = β-OH



Saikogenin B

BIOLOGICAL ACTIVITY

Saponin (mixed saikosides) exhibited strong central depressant activity. Its LD₅₀ was 4.7 g/kg (oral) in mice, 58.3 mg/kg (i.p.) in guinea pigs and it was highly haemolytic in rats. Oral administration of 200-800 mg/kg to mice produced sedative, analgesic and antipyretic effects, but no anticonvulsant activity or reduction of muscle tone (*Yakugaku Zasshi* 1969, 89, 712; *Chem. Abstr.* 1969, 71, 69253 t); root saponin mixture was effective at 400 mg/kg in treatment of rat paw oedema induced by dextran (*Jpn.* 10,923 (1967) June 16; *Chem. Abstr.* 1968, 68, 62696 u).

BURSERA (Burseraceae)

B. delpechiana Boiss. ex Engl.

Eng. - Lignloe tree

Essential oil contained ester and aldehyde (*Perf. Essent. Oil Record* 1965, 56, 85; *Chem. Abstr.* 1965, 62, 11623 f).

Distribution : A native of Mexico, introduced into India near Bangalore.

BUTEA (Papilionaceae)

B. frondosa Koen. ex Roxb.; see *B. monosperma* (Lam.) Taub.

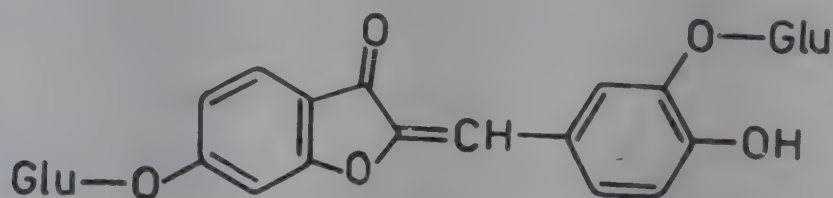
B. monosperma (Lam.) Taub. syn. *B. frondosa* Koen. ex Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 42).

Extracts of seeds, flowers and leaves reputed to have contraceptive property.

Alcoholic extract of seed prevented pregnancy in rats at a dose of 300 mg/kg on days 1 to 4 of pregnancy. At higher dose it was toxic. Flowers also showed encouraging anti-implantation activity in rats at a dose of 300 mg/kg (*Indian J. Med. Res.* 1968, 56, 1575).

Synthesis of a coumaranone glucoside - palasitrin - from the plant (*Chem. Ber.* 1960, 93, 1272); palasonin, mp. 106°, from the seeds (*Indian J. Chem.* 1967, 5, 86).

NEW COMPOUNDS



Palasitrin

BIOLOGICAL ACTIVITY

Palasonin and its sodium and piperazine salts showed anthelmintic activity, minimal lethal concentrations being 1.0 and 0.75 mg/kg respectively against *Ascaris lumbricoides* of human origin. A single oral dose of sodium salt (25 mg/kg) or piperazine salt (20 mg/kg) was completely effective against *Toxocaria canis* in dogs. LD50 values (s.c.) for sodium and piperazine salts were 7.5 and 20 mg/kg respectively in mice (*Indian J. Med. Res.* 1968, 56, 1818).

Active principle of seed is an alkaloid which has physostigmine-like action as shown by specific atropine blockade, potentiation of acetylcholine responses and antagonism of curare action (*Indian J. Med. Sci.* 1961, 15, 353).

BUTOMUS (Butomaceae)

B. umbellatus L.

Glucose, galactose, fructose, sucrose, raffinose and stachyose detected by PC in enzymic degradation products of extract of rhizomes (*Bull. Soc. Bot. Fr.* 1956, 103, 444; *Chem. Abstr.* 1962, 56, 712 d).

Distribution : Punjab and Kashmir in marshy localities, ascending to 1500 m.

CACCINIA (Boraginaceae)

C. crassifolia O. Kuntze syn. *C. glauca* Savi (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 43).

Acid hydrolysis of plant extract yielded caccinetin (*Indian J. Pharm.* 1963, 25, 217); rutin

and triterpenoid saponin from leaves (*Indian J. Chem.* 1964, 2, 130); saponin mixture, mp. 230°, from leaves on hydrolysis gave glucose, rhamnose and caccigenin, mp. 273°, (*Tetrahedron Lett.* 1966, 1947; *Indian J. Chem.* 1970, 8, 593).

BIOLOGICAL ACTIVITY

Saponin and its aglycone showed diuretic action apparently due to increase in glomerular filtration (*J. Pharm. Sci.* 1962, 51, 1040).

C. glauca Savi; see *C. crassifolia* O. Kuntze

CAESALPINIA (Caesalpinaceae)

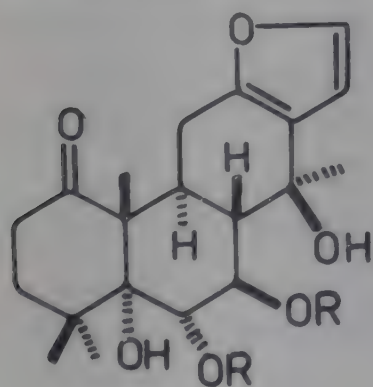
C. bonducella (L.) Fleming; see *C. bonduc* (L.) Roxb. emend. Dandy & Exell.

C. bonduc (L.) Roxb. emend. Dandy & Exell. syn. *C. bonducella* (L.) Fleming, *C. crista* L. (*Glossary Indian Med. Plants.* Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 43).

α -Caesalpin, mp. 187°, β -caesalpin, mp. 243°, γ -caesalpin and δ -caesalpin isolated from seeds (*Chem. Ind.* 1960, 463; *Pakistan J. Sci. Ind. Res.* 1960, 3, 48; *Chem. Abstr.* 1961, 55, 18901 b; *Gazz. Chim. Ital.* 1966, 96, 687; *Chem. Abstr.* 1966, 65, 8968 h; *Gazz. Chim. Ital.* 1966, 96, 662; *Chem. Abstr.* 1966, 65, 8968 a; *Tetrahedron Lett.* 1963, 2079); ξ -caesalpin, mp. 191°, isolated from seeds and its structure established (*Tetrahedron Lett.* 1967, 5027); structures of caesalpins α , β and γ elucidated (*Chem. Commun.* 1970, 1244).

Note: *C. bonducella* and *C. crista* are synonymous with *C. bonduc*. Further *C. bonduc* and *C. jayabo* are two distinct species; however, both are treated as one in *Glossary of Indian Medicinal Plants*.

NEW COMPOUNDS

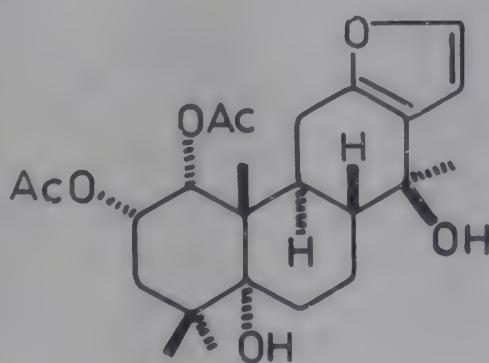


α -Caesalpin

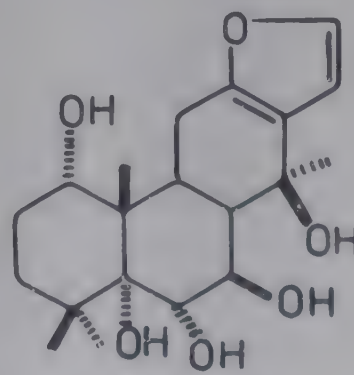
R = Ac

β -Caesalpin

R = H



γ -Caesalpin



δ -Caesalpin

C. cristata L.; see *C. bonduc* (L.) Roxb. emend. Dandy & Exell.

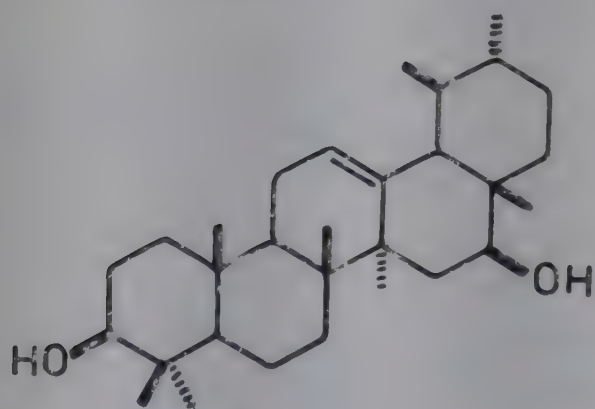
C. pulcherrima (L.) Swartz. syn. *Poinciana pulcherrima* L. (*Glossary Indian Med. Plants.* Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 44).

3-Rhamnoside of myricitrin (*C. R. Acad. Sci. Paris, Ser. D* 1965, 260, 271; *Chem. Abstr.* 1965, 62, 12154 h).

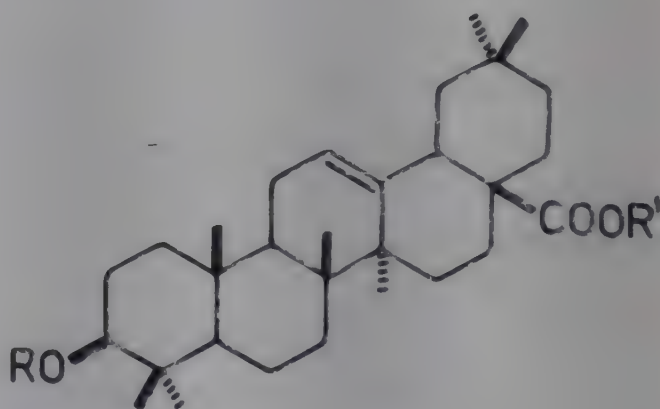
CALENDULA (Asteraceae)

C. officinalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 45).

β -Carotene, lycopene, violaxanthin, rubixanthin, hentriacontane and two phytosterols (*Zh. Prikl. Khim.* 1960, 33, 484; *Chem. Abstr.* 1960, 54, 12274 h); ceryl alcohol, stigmasterol, faradiol, mp. 196° and calendin, mp. 153° (*Collect. Czech. Chem. Commun.* 1961, 26, 890); taraxasterol and a yellow solid, mp. 93°, from alkaline hydrolysis of plant extract (*J. Org. Chem.* 1961, 26, 5228); isorhamnetin-3-rutinoside (narcissin), isorhamnetin-3-glucoside and two other isorhamnetin glycosides isolated (*Arch. Pharm.* 1962, 295, 464; *Chem. Abstr.* 1962, 57, 15238 h); five glycosides of oleanolic acid isolated: 3-glucuronide (I), 3-galactosyl-glucuronide (II), 3-galactosyl-glucuronide-17-glucoside (III), 3-galactosyl(glucosyl)-glucuronide (IV) and 3-galactosyl(glucosyl)-glucuronide-17-glucoside (V) and their structures determined (*Phytochemistry* 1967, 6, 69); α -amyrin, β -amyrin, taraxasterol, lupeol, brein, calenduladiol and arnidiol from flowers (*Phytochemistry* 1968, 7, 1631); calenduloside A, mp. 260°, isolated and identified as galactosyl- glucoside of oleanolic acid (*Khim. Priir. Soedin.* 1969, 5, 58; *Chem. Abstr.* 1969, 71, 773 v).

NEW COMPOUNDS

Brein



I

R = Gluc.acid, R' = H

II

R = Gluc.acid-Gal, R' = H

III

R = Gluc.acid-Gal, R' = Glu

IV

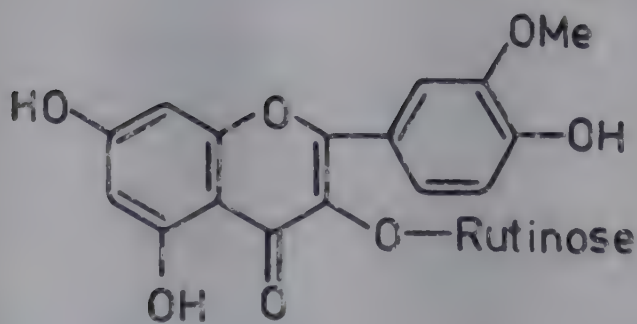
R = Gluc.acid-(Glu)-Gal, R' = H

V

R = Gluc.acid-(Glu)-Gal, R' = Glu

Calenduloside A

R = Glu-Gal, R' = H



Isorhamnetin-3-rutinoside

CALONYCTION (Convolvulaceae)

C. aculeatum House; see *Ipomoea alba* L.

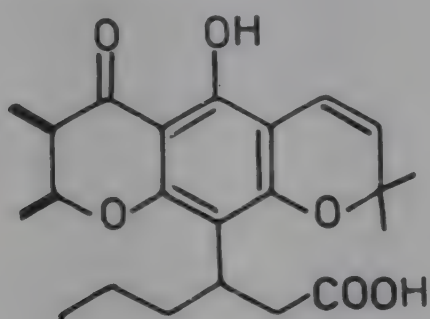
C. muricatum (L.) G. Don.; see *Ipomoea turbinata* Lag.

CALOPHYLLUM (Clusiaceae)

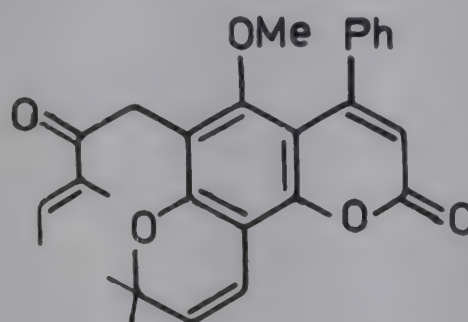
C. apetalum Willd. syn. *C. wightianum* Wall. ex Planch. & Triana (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 46).

Friedelin and a new acid - apetalic acid, mp. 117° - from bark (*Tetrahedron Lett.* 1967, 4177); isolation and structure elucidation of apetalolide, mp. 203° , from kernels along with β -sitosterol glucoside (*Tetrahedron Lett.* 1967, 2633; *Planta Med.* 1968, 16, 450); friedelin, β -amyrin, β -sitosterol, betulinic acid and xanthone from bark (*Phytochemistry* 1969, 8, 323).

NEW COMPOUNDS



Apetalic acid



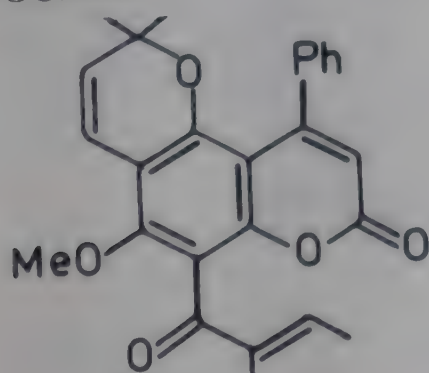
Apetalolide

C. elatum Bedd.; see *C. polyanthum* Wall. ex Choisy

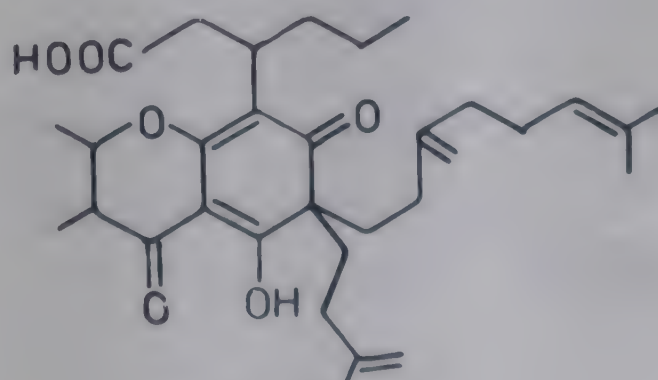
C. inophyllum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID. New Delhi, 1956, p. 46).

4-Phenylcoumarins - calophyllolide, inophyllolide and calophyllic acid from ripe seeds; cinnamic acid, inophyllic and calophyllic acids and a new 4-phenylcoumarin - ponnalide from unripe seeds (*Bull. Nat. Inst. Sci. India* No. 31, 1965, 91; *Chem. Abstr.* 1967, 66, 26565 a; *Ceylon Ass. Advan. Sci., Proc. Annu. Sess.* 1966, 22, 193; *Chem. Abstr.* 1969, 70, 57576 s); a new myricetin glucoside, myricetin and quercetin from androecium; leucocyanidin from petals (*Bull. Nat. Inst. Sci. India* No. 31, 1965, 91; *Chem. Abstr.* 1967, 66, 26561 w); friedelin, 3 new triterpenes - canophyllal, canophyllol and canophyllic acid (*Tetrahedron* 1967, 23, 1901); (+)inophyllolide, mp. 188° , its cis isomer, mp. 149° and 12-hydroxy derivative of cis isomer, mp. 200° , from leaves (*Tetrahedron Lett.* 1968, 2383); inophylloidic acid from bark resin (*Tetrahedron Lett.* 1968, 3285); jacareubin, 6-deoxyjacareubin and 2-(3, 3-dimethylallyl)-1,3,5,6-tetrahydroxanthone from heartwood (*Phytochemistry* 1969, 8, 927).

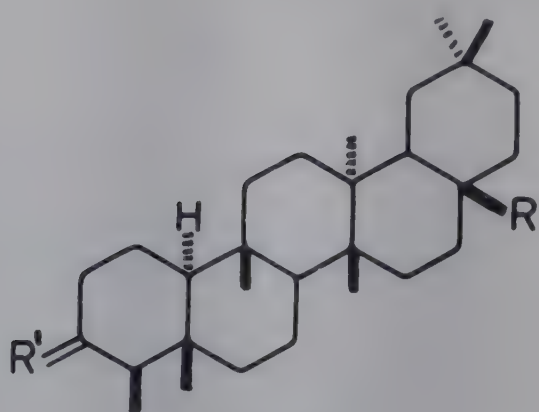
NEW COMPOUNDS



Calophyllolide



Inophylloidic acid



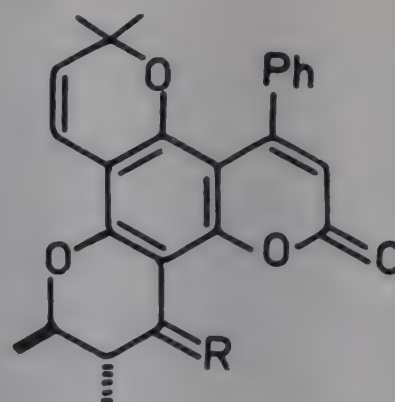
Canophylllic acid

R = COOH, R' = β -OH, H

Canophyllal

R = CHO, R' = O

Canophyllol

R = CH₂OH, R' = O

(+)Inophyllolide

R = H, H

Inophyllolide-12-o1

R = H, OH

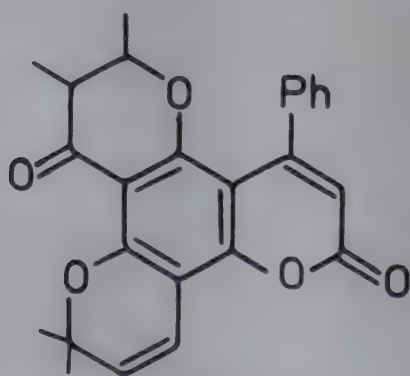
BIOLOGICAL ACTIVITY

Anticoagulant activity of calophyllolide was compared with that of dicoumarol, ethylbis-coumacetate and nicoumalone in rabbits. Single oral dose of 50 mg/kg reduced coagulation valency to 18 to 22% after 48 hrs. Oral administration upto 1.75 gm/kg was not fatal in rats. Its LD₅₀ in rats i.p. was 560 mg/kg (*J. Pharm. Pharmacol.* 1962, 14, 534).

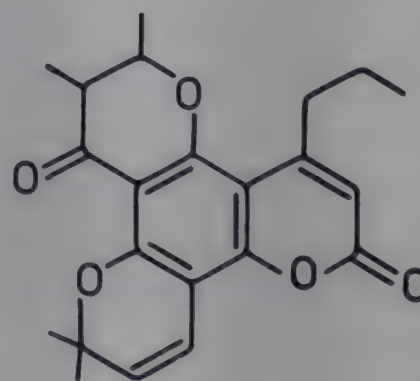
C. polyanthum Wall. ex Choisy syn. *C. elatum* Bedd., *C. tomentosum* auct. (non Wight) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 46).

Tomentolide A, mp 201°, tomentolide B, 158° (*Tetrahedron Lett.* 1967, 2633; *Planta Med.* 1968, 16, 450); friedelin, epi-friedelinol and β -sitosterol present in bark (*Phytochemistry* 1969, 8, 323).

NEW COMPOUNDS



Tomentolide A



Tomentolide B

C. tomentosum Wight; see *C. polyanthum* Wall. ex Choisy

C. wightianum Wall. ex Planch. & Triana; see *C. apetalum* Willd.

CALOTROPIS (Asclepiadaceae)

C. gigantea (L.) R.Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New

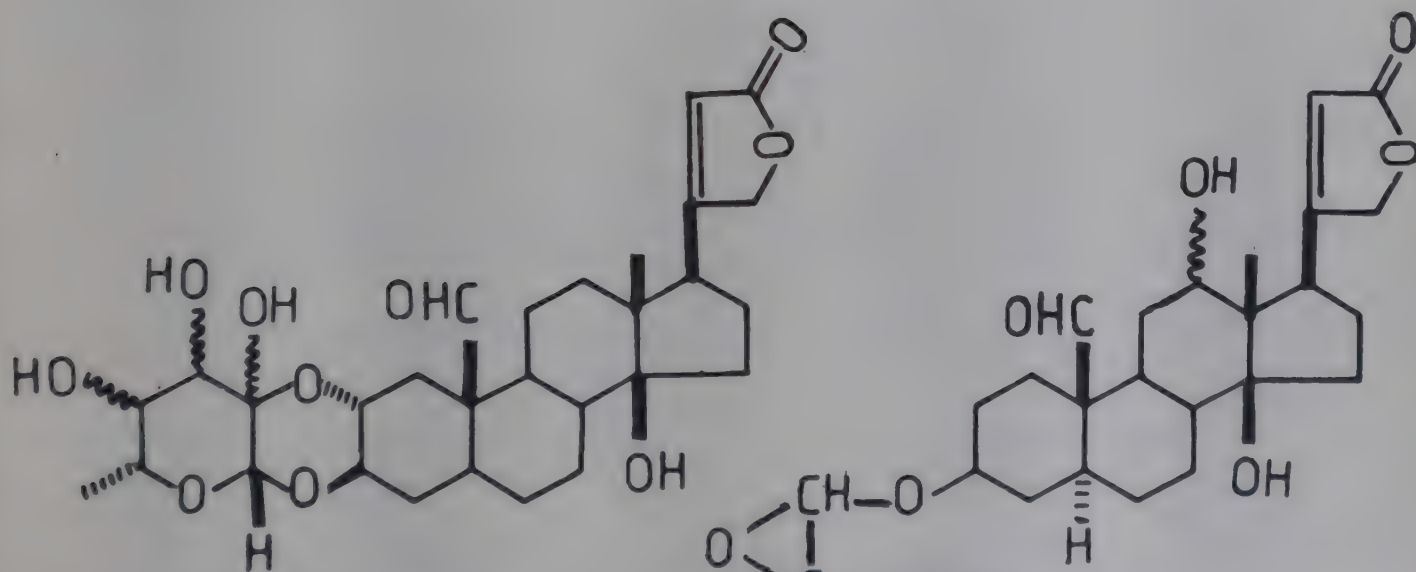
Delhi, 1956, p. 46).

α -Amyrin, β -amyrin, taraxasterol, ψ -taraxasterol and β -sitosterol isolated (*Curr. Sci.* 1968, 37, 156).

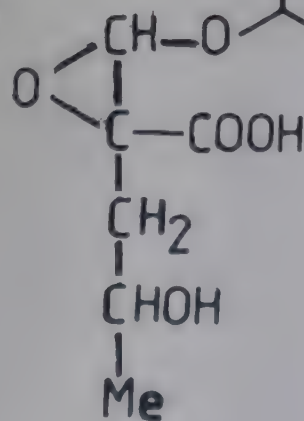
C. procera (Ait.) R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 46).

Voruscharin, mp. 165° dec., isolated from African plant (*Ann. Chem.* 1960, 632, 158; *Helv. Chim. Acta* 1969, 52, 2276); conversion of calactin to calactinic acid; calactin composed of calotropagenin and hexose; uzarigenin, syriogenin and proceroside isolated from latex; proceroside characterised (*Helv. Chim. Acta* 1969, 52, 2086; *J. Chem. Soc.* 1963, 1866); structures of calotoxin, calotropin, uscharidin and calactinic acid revised (*Tetrahedron Lett.* 1963, 63; *Helv. Chim. Acta* 1969, 52, 2276; *ibid.* 1970, 53, 167; benzoyllineolone and benzoylisolineolone from root bark (*Aust. J. Chem.* 1968, 21, 1625).

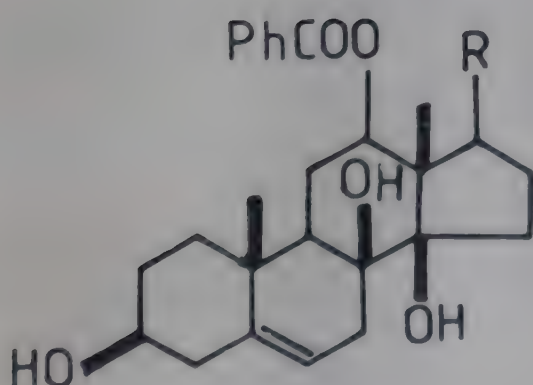
NEW COMPOUDNS



Calotoxin



Calactinic acid

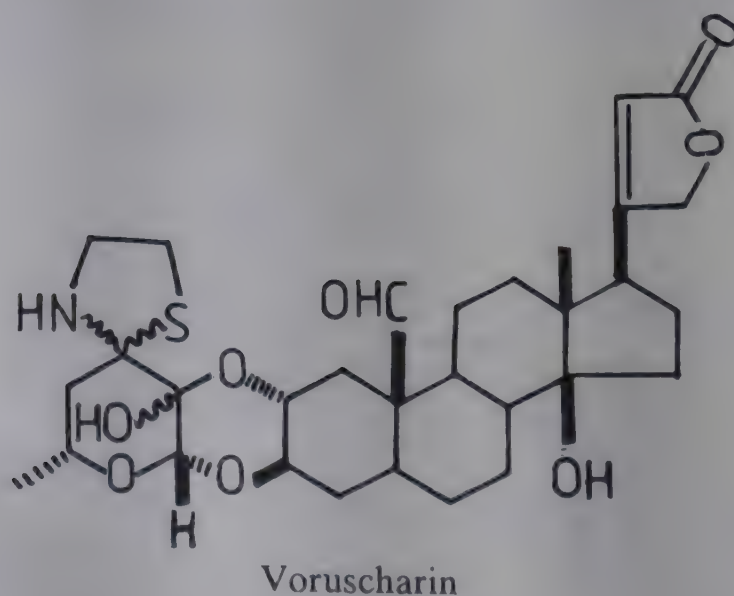
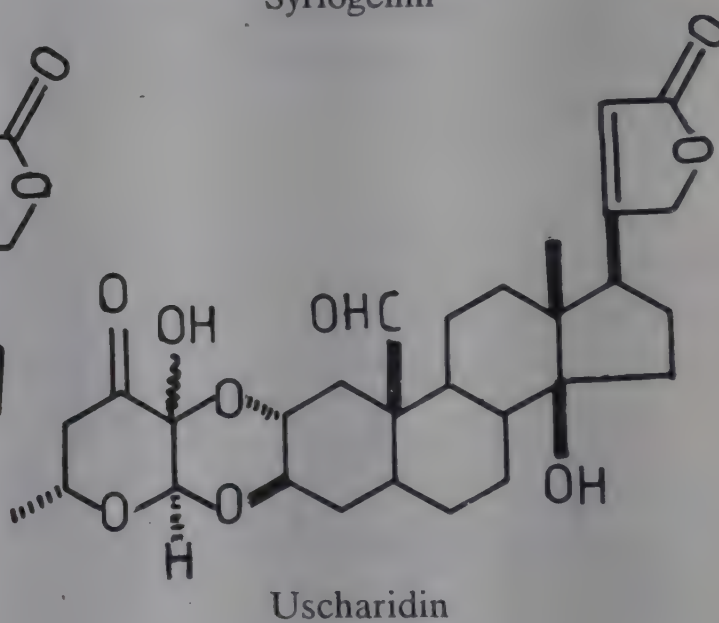
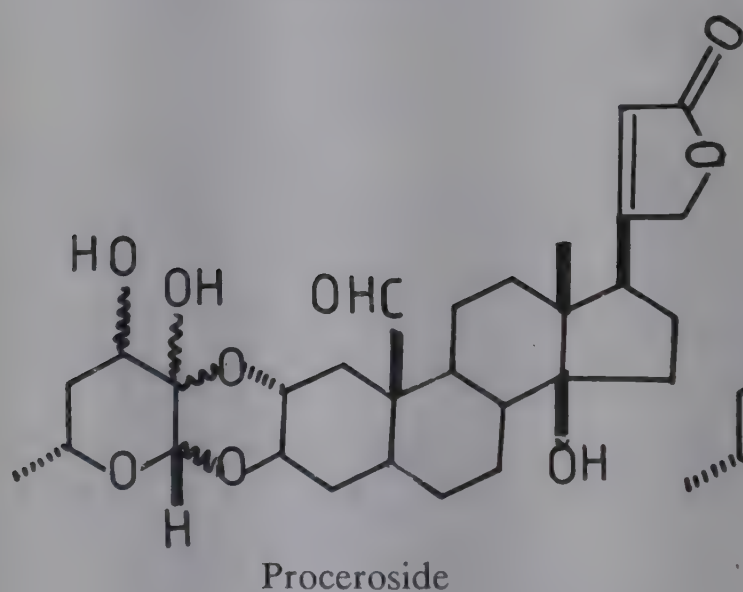
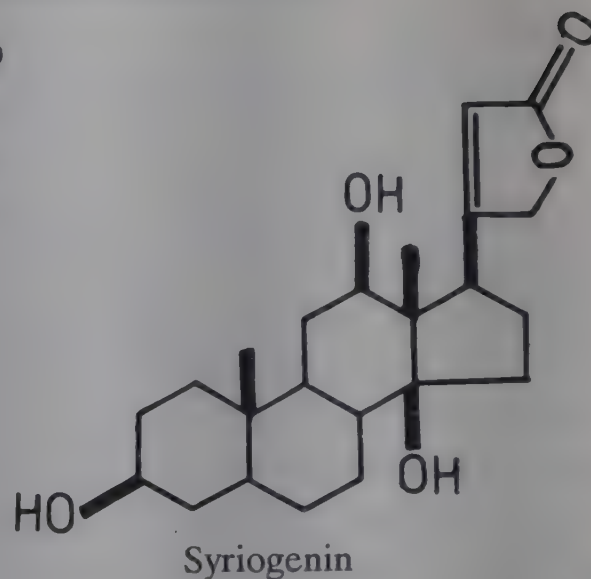
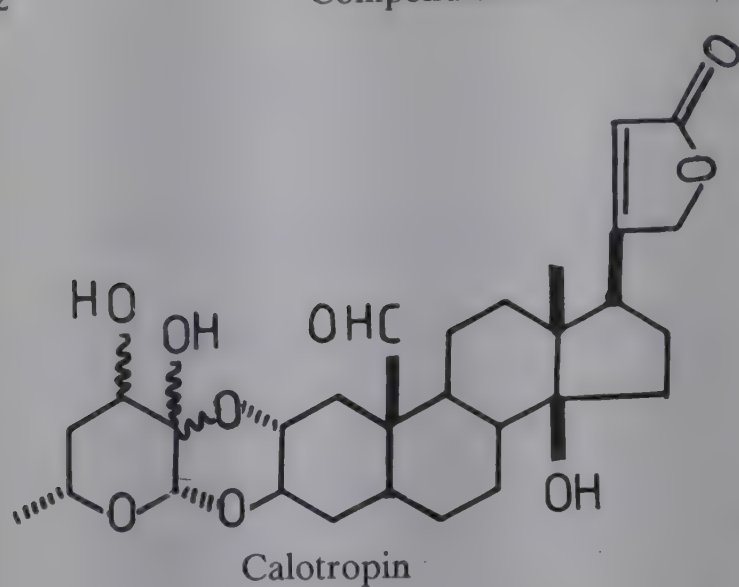


Benzoyllineolone

R = α -Ac

Benzoylisolineolone

R = β -Ac



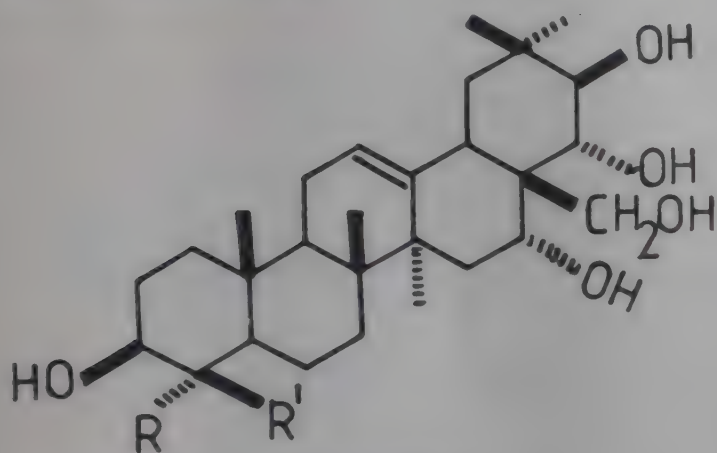
CAMELLIA (Theaceae)

C. sinensis (L.) Kuntze syn. *C. theifera* Griff., *Thea sinensis* L. (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 47).

Two linalool epoxides identified in essential oil of leaves (*Agric. Biol. Chem.* 1964, 28, 653; *Chem. Abstr.* 1965, 62, 3881 a); saponin from seeds composed of four sapogenols A, B, C and

D; sapogenol B was identical with barringtonol C (*Tetrahedron Lett.* 1966, 5973); theasapogenol A, mp. 301° and theasapogenol B from seeds (*Tetrahedron Lett.* 1966, 5979); structure of theasapogenol E, mp. 237°, assigned (*Chem. Ind.* 1966, 2202); structure of theaspirone elucidated as 1-oxa-8-oxo-2,6,10,10-tetramethylspiro-[4,5]-6-decene and 2-hydroxy-2,6,6-trimethylcyclohexylidene-1-acetic acid lactone, mp. 40°, from essential oil (*Tetrahedron Lett.* 1968, 2777).

NEW COMPOUNDS



Theasapogenol A

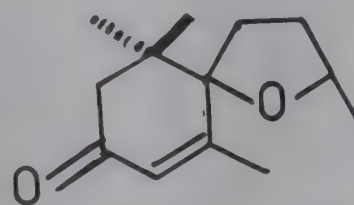
R = CH₂OH, R' = Me

Theasapogenol B

R, R' = Me

Theasapogenol E

R = CHO, R' = Me



Theaspirone

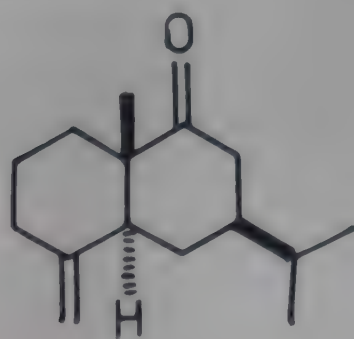
C. theifera Griff.; see *C. sinensis* (L.) Kuntze

CANARIUM (Burseraceae)

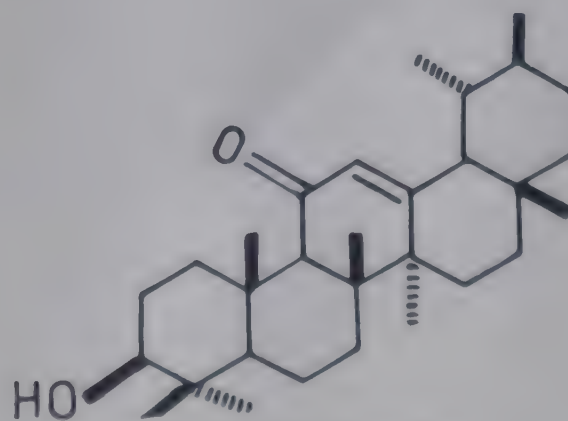
C. strictum Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 48).

A new sesquiterpene ketone - canarone (*J. Org. Chem.* 1964, 29, 2479); (+)juneol, epikhusinol, canarone, ψ -taraxasterol, ψ -epitaraxasterol, α -amyrin, β -amyrin and its acetate, 11 β -hydroxy- α -amyrin and 11-keto- α -amyrin isolated from dammar resin (*Tetrahedron* 1965, 21, 3197).

NEW COMPOUNDS



Canarone



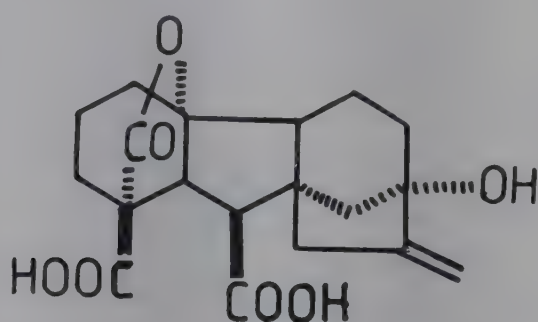
11-Keto- α -amyrin

CANAVALIA (Papilionaceae)

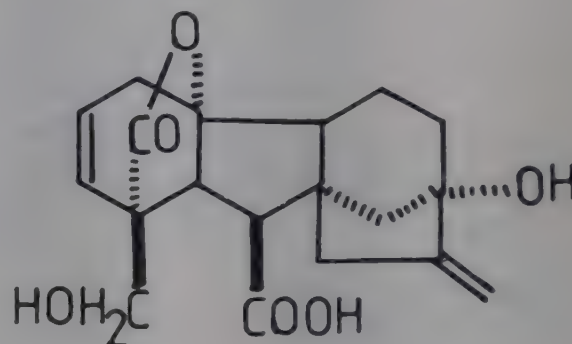
C. ensiformis (L.) DC.; see *C. gladiata* (Jacq.) DC.

C. gladiata (Jacq.) DC. syn. *C. ensiformis* auct. (non L.) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 48).

Structures of canavalia gibberellin I and canavalia gibberellin II assigned (*Tetrahedron Lett.* 1967, 4861; *Agric. Biol. Chem.* 1969, 33, 598).

NEW COMPOUNDS

Canavalia gibberellin I



Canavalia gibberellin II

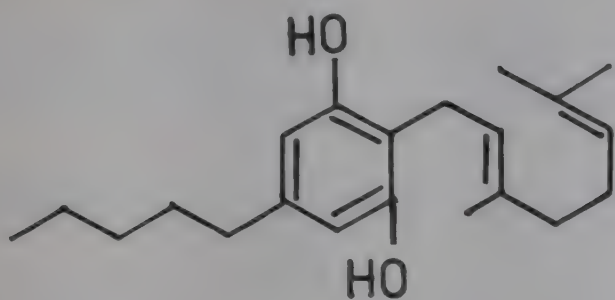
CANNABIS (Cannabaceae)

C. sativa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 48).

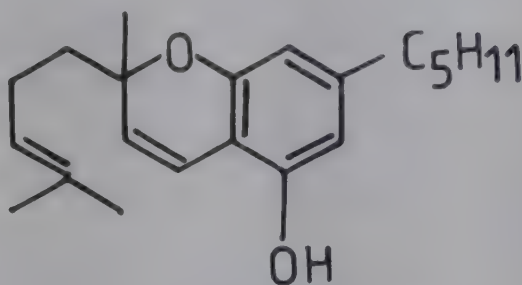
Seed oil and its unsaponifiable fraction at 300 and 100 mg/kg, i.v., respectively in rabbits did not inhibit corneal blink reflex. Crude resin (7 µg/ml) and a phenolic compound (7 µg/ml) from leaves were highly toxic to small fish (*Lebistes reticulatus*) with mortalities of 85 and 97% respectively (*Med. Pharmacol. Exp.* 1967, 16, 219).

Isolation of cannabidiolic acid (3-methyl-6-isopropenyl-4'-pentyl-2',6'-dihydroxy-1,2,3,6-tetrahydrobiphenyl-3'-carboxylic acid), mp. 127°, its acetate, cannabidiol, cannabinol, tetrahydrocannabinol, trans-cinnamic acid and n-nonacosane (*Acta Univ. Palackianae Olomucensis* 1958, 16, 9; *Chem. Abstr.* 1960, 54, 12054 a; *Pharmazie* 1959, 14, 349; *Chem. Abstr.* 1960, 54, 13543 h; *Tetrahedron* 1965, 21, 1223; *ibid.* 1963, 19, 2073; *Arch. Pharm.* 1962, 295, 66; *Chem. Abstr.* 1962, 56, 13010 e); synthesis of tetrahydrocannabinol (*Ann. Chem.* 1960, 630, 71); eugenol, guaiacol and two unknown carbonyl compounds from volatile phenolic fraction (*Bull. Agric. Chem. Soc. Jpn.* 1960, 24, 667; *Chem. Abstr.* 1961, 55, 5670 c); synthesis of cannabigerol, mp. 57° (*Proc. Chem. Soc.* 1964, 82; *Chem. Abstr.* 1964, 60, 13275 c); cannabichromene and 1-dehydro-tetrahydrocannabinol isolated (*Chem. Commun.* 1966, 20).

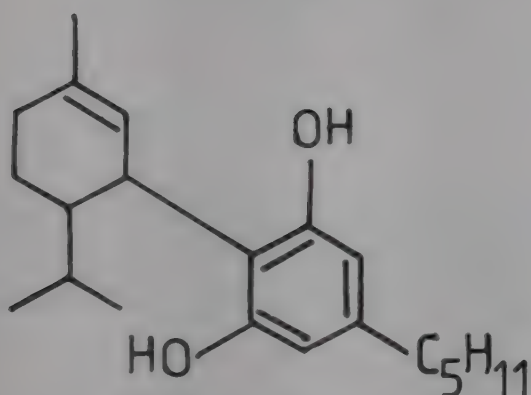
NEW COMPOUNDS



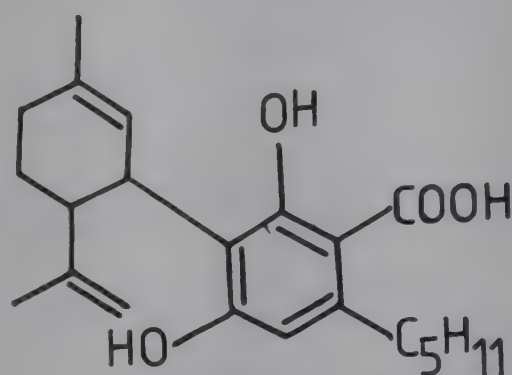
Cannabigerol



Cannabichromene



Cannabidiol



Cannabidiolic Acid

CANSORA (Gentianaceae)

C. decussata (Roxb.) J.A. Schult & J.H. Schult (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 49).

Compounds I and II isolated from whole plant (*Arch. Int. Pharmacodyn. Ther.* 1960, 124, 358; *Chem. Abstr.* 1960, 54, 14474 h).

BIOLOGICAL ACTIVITY

Compound I reduced blood pressure and the rate and force of heart contraction. It increased the effect of acetylcholine on skeletal muscle and stimulated smooth muscles of intestine, uterus and bronchus. Compound II did not show these effects but prolonged the narcotic effect of pentobarbital. Its acute toxicity in rats was much less than that of I (*Arch. Int. Pharmacodyn. Ther.* 1960, 124, 358; *Chem. Abstr.* 1960, 54, 14474 h).

CAPPARIS (Capparaceae)

C. aphylla Roth; see *C. decidua* (Forsk.) Edgew.

C. decidua (Forsk.) Edgew. syn. *C. aphylla* Roth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 49).

Capparine, mp. 236°, capparilline, mp. 188° and capparinine, mp. 229°, isolated (*Pakistan J. Sci. Ind. Res.* 1968, 11, 250; *Chem. Abstr.* 1969, 71, 778 a); n-pentacosane, n-triacontanol, β -sitosterol and l-stachydrine (*Planta Med.* 1969, 17, 95).

C. moonii Wight

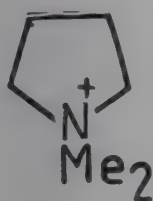
S. - Rudanti; Bo. - Wagati.

Plant extract showed little effect in vivo and in vitro on growth of *Myobacterium tuberculosis* or its lesions in susceptible animals; it did not show any bacteriostatic property *in vitro* (*Indian J. Med. Sci.* 1962, 15, 343).

Rutin, β -sitosterol and l-stachydrine, mp. 232° , isolated from fruits (*J. Sci. Ind. Res.* 1960, 19B, 409).

Distribution : Throughout Western Ghats.

NEW COMPOUNDS



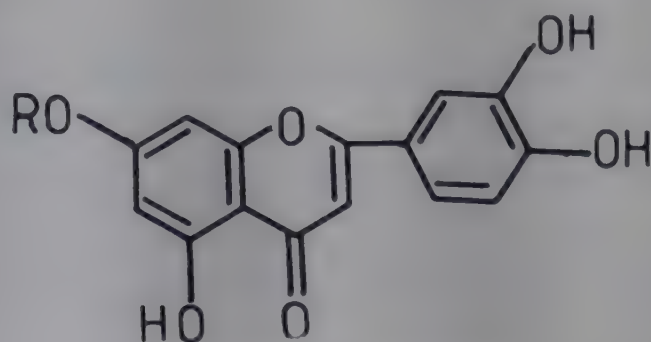
l-Stachydrine

CAPSELLA (Brassicaceae)

C. bursa-pastoris (L.) Medik. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 50).

A new flavonoid - luteolin-7-rutinoside, mp. 184° - and quercetin-3-rutinoside from bark (*Diss. Pharm. Pharmacol.* 1965, 17, 389; *Chem. Abstr.* 1966, 64, 10086 c); luteolin-7-galactoside, mp. 228° , from bark (*Diss. Pharm. Pharmacol.* 1967, 19, 557; *Chem. Abstr.* 1968, 68, 59841 g).

NEW COMPOUNDS



Luteolin-7-galactoside

R = Gal

Luteolin-7-rutinoside

R = Rutin

CAPSICUM (Solanaceae)

C. annuum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 50).

Pungent principle - capsaicin - isolated (*Herb. Hung.* 1966, 5, 225; *Chem. Abstr.* 1968 43125 r) and assigned the structure N-(4-hydroxy-3-methoxybenzyl)-8-methyl-trans-6-non-

enamide (*Nippon Nogeikagaku Kaishi* 1961, 35, 596; *Chem. Abstr.* 1964, 60, 1807 e); saponin - capsicidin - present in root, cortex and seeds (*Experientia* 1965, 21, 383); determination of capsaicin content in fruit (*Rev. Med.* 1962, 8, 485; *Chem. Abstr.* 1963, 59, 8543 d).

NEW COMPOUNDS

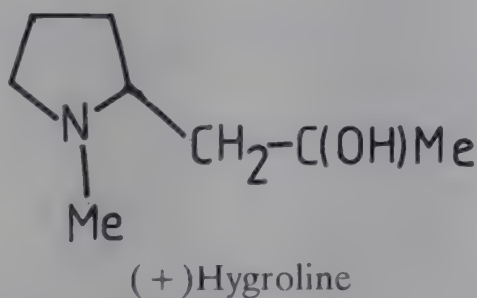


CARALLIA (Rhizophoraceae)

C. brachiata (Lour.) Merr. syn. *C. integerrima* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 50).

Alkaloid - (+)hygroline, mp. 29° - present in leaves but absent in bark (*Aust. J. Chem.* 1965, 18, 589).

NEW COMPOUNDS



C. integerrima DC.; see *C. brachiata* (Lour.) Merr.

CARALLUMA (Asclepiadaceae)

C. tuberculata N.E. Brown syn. *Boucerosia aucheriana* Decne. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 40).

Hydrolysis of glycoside mixture yielded cymarose, sarmentose, oleandrose and digitoxose (*Chem. Pharm. Bull.* 1967, 15, 725).

CARDAMINE (Brassicaceae)

C. impatiens L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 51).

Two major triglycerides from seed oil (*Lipids* 1966, 1, 289; *Chem. Abstr.* 1966, 65, 15791 b).

CAREYA (Lecythidaceae)

C. arborea Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 51).

Lupeol, β -sitosterol, betulin and an unidentified compound from bark (*Indian J. Chem.* 1964, 2, 510).

CARICA (Caricaceae)

C. papaya L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 51).

Alcoholic extract of seeds and alkaloid fraction stimulated isolated intestine, depressed frog heart and blood pressure. The extract paralysed *Pheretima posthuma* and rat tapeworm *in vitro*; it reduced ova count and expelled tapeworms *in vivo* in a significant number of rats (*Indian J. Med. Sci.* 1961, 15, 888).

Identification of carotenoids - phytoene, phytofulene, β -carotene, cis- β -carotene, (-) carotene, pigment X, 5,6-monoepoxy- β -carotene, mutatochrome, auxochrome, cryptoxanthin, cryptoflavine, violaxanthin, cis-violaxanthin and antheraxanthin - in plant (*Indian J. Chem.* 1964, 2, 451); nicotine, cotinine and myosmine (*Tydsker. Natuurwetensk* 1968, 8, 156; *Chem. Abstr.* 1969, 71, 36405 r).

CARISSA (Apocynaceae)

C. carandas L.; see: *C. conjesta* Wight

C. conjesta Wight syn. *C. carandas* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 52).

Roots used as purgative and antidote for snake-bite and leaves for remittent fever (*Phytochemistry* 1968, 7, 495); extractives from root, stem and leaves of *C. carandas* and *C. spinarum* showed positive inotropic activity on hypodynamic guinea pig heart and isolated papillary muscle preparation of cat. ECG changes produced in cats were typical of a cardenolide. Emetic and musculotropic activities also studied; cardiogenic activity of *C. spinarum* was 4 to 6 times that of *C. carandas* (*Indian J. Med. Res.* 1963, 51, 937).

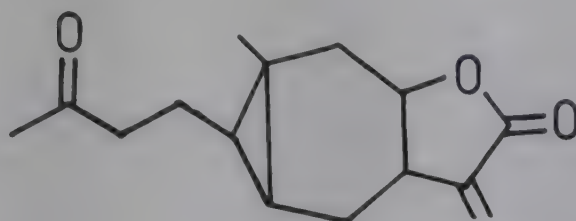
Hydrolysis of polar glycosides yielded odoroside H, digitoxigenin, 14,15-anhydrodigitoxigenin, glucose and D-digitalose (*Indian J. Chem.* 1967, 5, 215); lupeol, β -sitosterol, ursolic acid and methyl ursolate (*Phytochemistry* 1968, 7, 495).

CARPESIMUM (Asteraceae)

C. abrotanoides L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 52).

A lactone, bp. 162°/0.4 mm, from fruits (Yao Hsueh Hsueh Pao 1957, 5, 155; *Chem. Abstr.* 1962, 56, 541 a); isolation of new lactone - carabrone, mp. 90° - and its structure elucidation as perhydro-5 α -methyl-3-methylene-5-(3-oxobutyl)-cyclopropa-[f]benzofuran-2-one, along with an oily ketone, bp. 185°/0.1 mm and a nonketonic substance, bp. 161°/0.03 mm from fruits (*Proc. Chem. Soc.* 1964, 120; *Chem. Abstr.* 1964, 61, 690 f; *J. Chem. Soc. Suppl.* No. 1, 1964, 5503; *Chem. Abstr.* 1965, 63, 1820 h; *Jpn.* 2917 (1966), Feb. 22; *Chem. Abstr.* 1966, 64, 19449 f); synthesis of carabrone (*J. Chem. Soc. C* 1968, 2131).

NEW COMPOUDNS



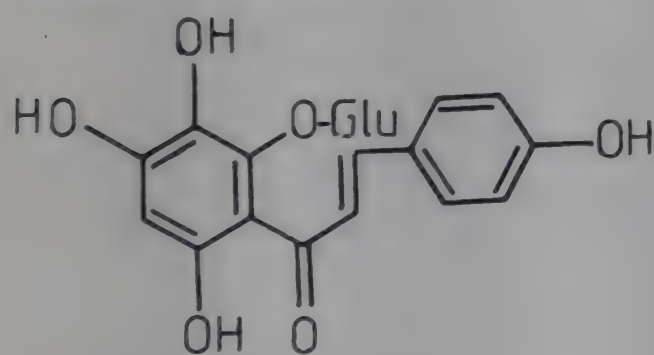
Carabrone

CARTHAMUS (Asteraceae)

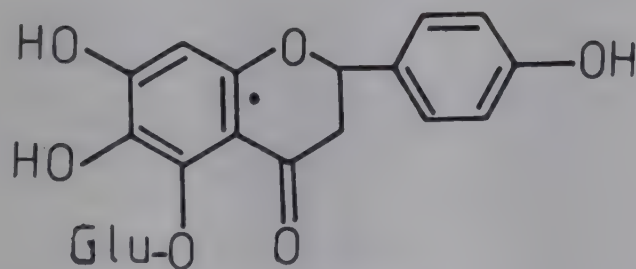
C. tinctorius L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 52).

Carthamin (6-glucosidoxy-2,4,4'-tetrahydroxychalcone) and neocarthamin (5-glucosidoxy-6,7,4'-trihydroxyflavanone) from yellow and ivory white varieties of plant (*Curr. Sci.* 1960, 29, 54); kaempferol-3-rhamnoglucoside and kaempferol glycoside from ivory white flowers (*J. Sci. Ind. Res.* 1962, 21B, 80).

NEW COMPOUDNS



Carthamin



Neocarthamin

CARUM (Apiaceae)

C. copticum Benth. & Hook.; see *Trachyspermum ammi* (L.) Sprague

CASEARIA (Flacourtiaceae)

C. esculenta Roxb.; see *C. ovata* (Lamk.) Willd.

C. ovata (Lamk.) Willd. syn. *C. esculenta* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 53).

Administration of alcoholic extract of roots to rats led to significant reduction in blood sugar level after two hours. Glucose tolerance was also favourably influenced by chronic administration of extracts. Favourable effects of drug in milder diabetic states (*Indian J. Med. Res.* 1967, 55, 754).

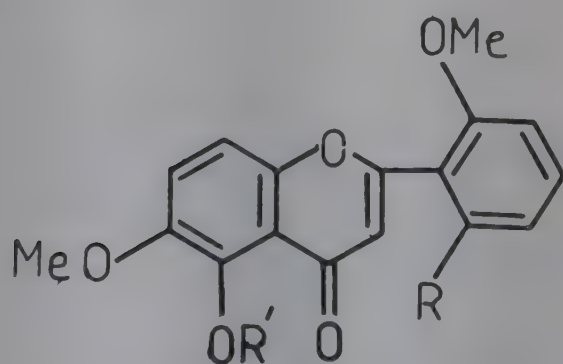
Two sterols, mp. 120° and 132° and a gutta-like substance, mp. 59°, from roots (*Curr. Sci.* 1960, 29, 136); leucopelargonidin, mp. 220°, from roots (*Curr. Sci.* 1965, 34, 634).

CASIMIROA (Rutaceae)*C. edulis* Llave & Lex

Eng. - White sapota, Cochil sapote.

Isolation and structure of 2',5,6-trimethoxyflavone, mp. 124°, zapotin (2',5,6,6'-tetramethoxyflavone) and zapotin (5-hydroxy-2',6,6'-trimethoxyflavone) (*Tetrahedron* 1960, 9, 139; *ibid.* 1967, 23, 2413; *ibid.* 1967, 23, 4607); 5-methoxy-8-geranyloxypsoralen, phellopterin, 2',5,6-trimethoxyflavone, 3',5,6-trimethoxyflavone, 1-methyl-2-phenyl-4-quinolone and zapoterin isolated (*J. Org. Chem.* 1968, 33, 3577); structure of zapotidine as 6-methylimidazo-(1,4-c)-tetrahydro-5-pyrimidinethione (*J. Am. Chem. Soc.* 1962, 83, 2022); structure and synthesis of eduline (*Koninkl. Ned. Akad. Wetenschap. Proc. Ser. B* 1960, 63, 430; *Chem. Abstr.* 1961, 55, 10488 b); structure of casimiroedine, stemmadenine and condylocarpine (*Tetrahedron Lett.* 1962, 357, 409; *J. Am. Chem. Soc.* 1973, 95, 8737); structure of zapoterin (*Tetrahedron Lett.* 1968, 5153).

Distribution : Native of C. America, occasionally cultivated in gardens for edible fruits.

NEW COMPOUNDS

2',5,6-Trimethoxyflavone

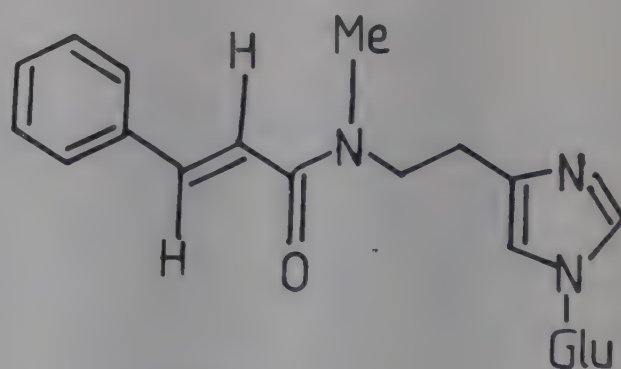
R = H, R' = Me

Zapotin

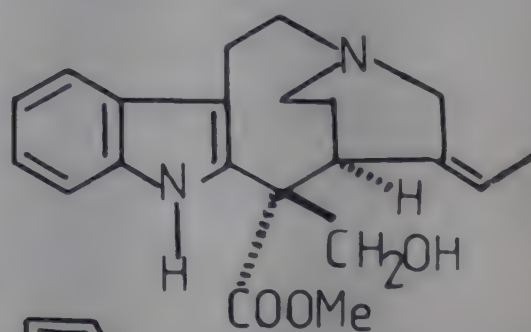
R = OMe, R' = Me

Zapotinin

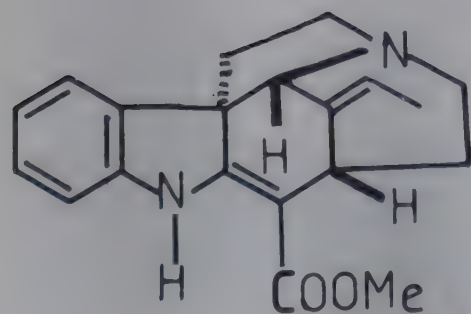
R = OMe, R' = H



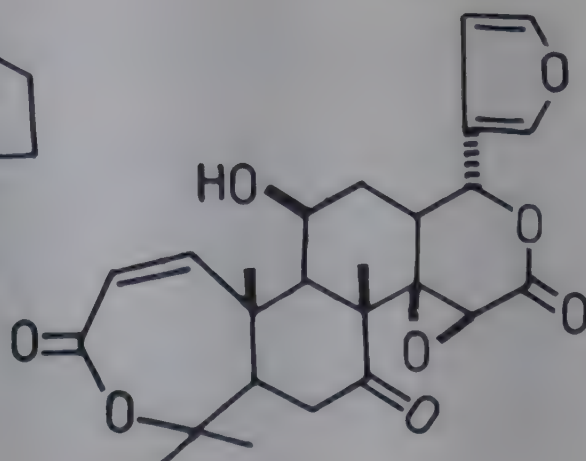
Casimiroedine



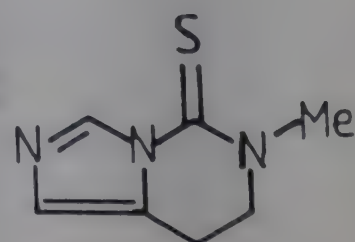
Stemmadenine



Condylocarpine



Zapoterin



Zapotidine

CASSIA (Caesalpiaceae)

C. absus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 53).

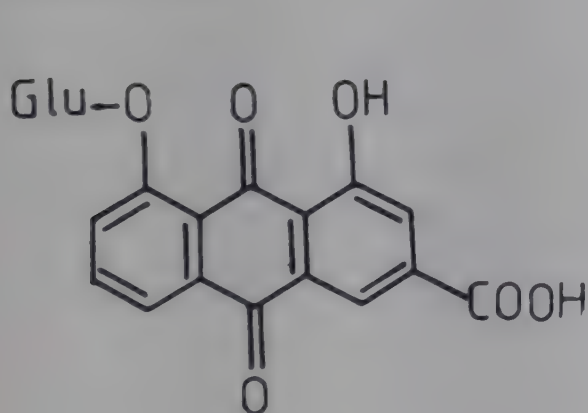
β -Sitosterol- β -glucoside from seed (*Pakistan J. Sci. Ind. Res.* 1964, 7, 219; *Chem. Abstr.* 1965, 63, 3314 h); a D-galacto-D-mannan composed of galactose (1 mole) and mannose (3 moles) isolated from seed (*Can. J. Chem.* 1969, 47, 2883).

***C. acutifolia* Delile**

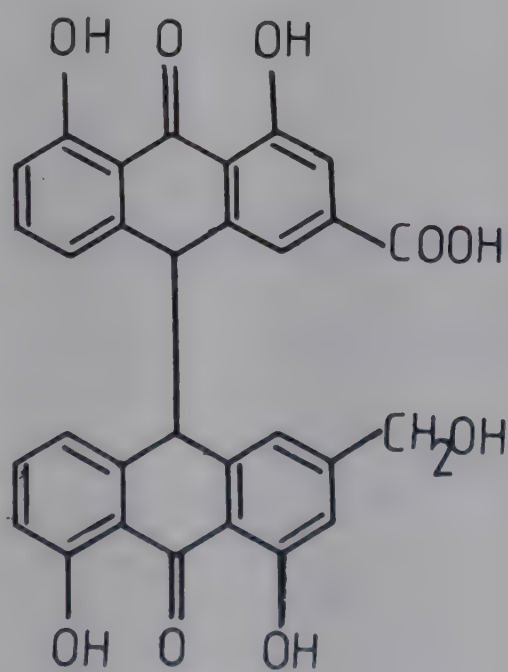
Eng. - Senna.

New glycoside from leaves and pods yielded aglycone - sennidin (*Pharm. Tijdschr. Belg.* 1962, 39, 67; *Chem. Abstr.* 1962, 57, 9953 g); gluco-aloeemodin (*Khim. Prir. Soedin.* 1965, 1, 294; *Chem. Abstr.* 1966, 64, 526 c); rhein-8-monoglucoside and another glucoside, mp. 183° (*Khim. Prir. Soedin.* 1966, 2, 143; *Chem. Abstr.* 1966, 65, 7627 e).

Distribution : Cultivated in south India.

NEW COMPOUNDS

Rhein-8-monoglucoside



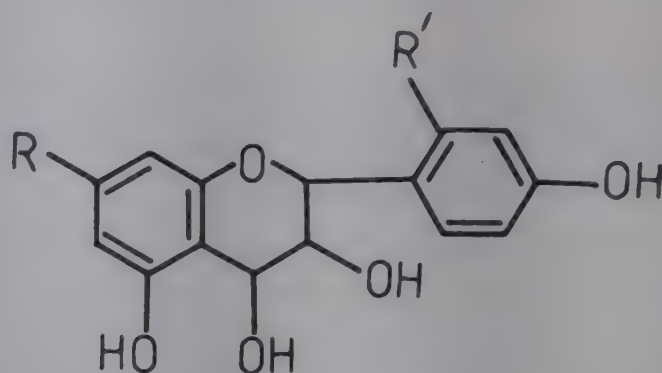
Sennidin

C. angustifolia Vahl; see *C. senna* L. var. *senna*

C. auriculata L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 54).

A new leucoanthocyanin - goratensidine - characterised as 4',5,7-trihydroxyflavan-3,4-diol (*Ann. Pharm. Fr.* 1962, 20, 583; *Chem. Abstr.* 1963, 58, 8231 g); (-)-auriculacacidin characterised as 5,2',4'-trihydroxyflavan-3,4-diol (*Aust. J. Chem.* 1968, 21, 1633).

NEW COMPOUNDS



Goratensidine

R = OH, R' = H

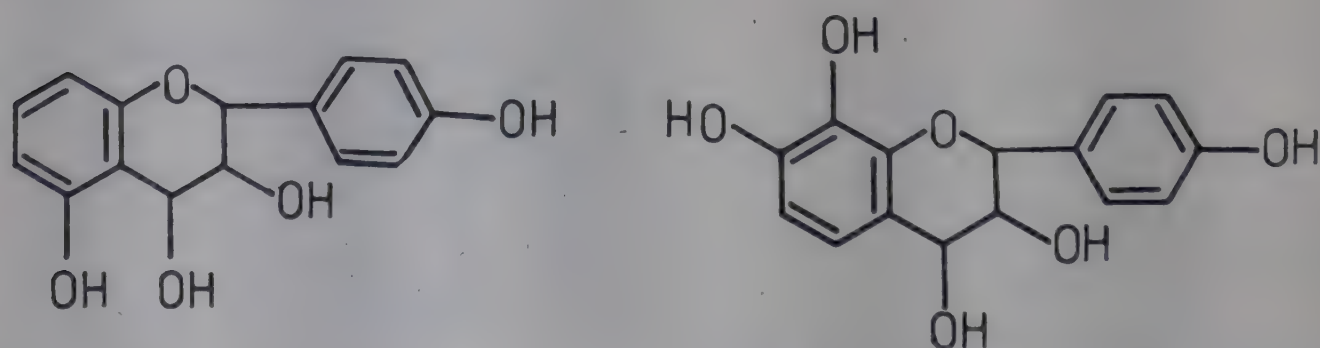
Auriculacacidin

R = H, R' = OH

C. fistula L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 54).

Fistucacidin, mp. 245°, from bark identified as racemic or meso 3,4,4',7,8-pentahydroxyflavan (*Curr. Sci.* 1964, 33, 175; *Bull. Nat. Inst. Sci. India* No. 31, 1965, 28; *Chem. Abstr.* 1967, 66, 44257 z; *Tetrahedron* 1967, 23, 515); glucoside from pod identified as rhein glucoside (*Indian J. Pharm.* 1965, 27, 71); lupeol, β -sitosterol and hexacosanol (*J. Indian Chem. Soc.* 1968, 45, 744); leucoanthocyanidin - 5,4'-dihydroxyflavan-3,4-diol (I) - from sapwood (*Leather Sci.* 1968, 15, 171; *Chem. Abstr.* 1969, 70, 47233 p).

NEW COMPOUNDS



I

Fistucacidin

C. italica (Mill.) Lam. ex F.W. Andr. syn. *C. obovata* (L.) Collad. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1965, p. 54).

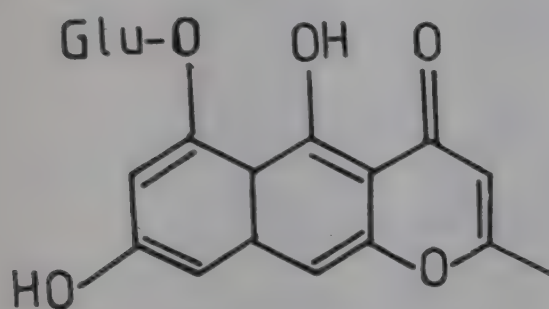
Sennosides A and B from leaves and pods (*Lloydia* 1962, 25, 238).

C. obtusifolia L. syn. *C. tora* auct. (non L.) p.p. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 54).

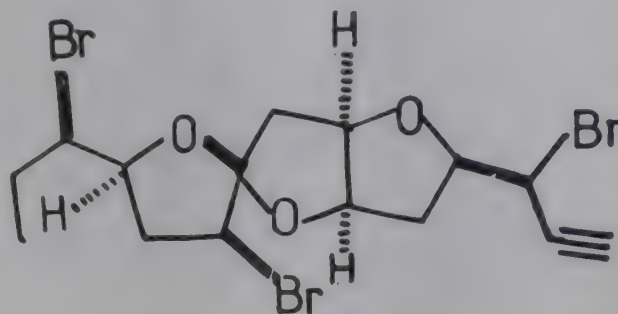
Obtusin, mp. 242°, chrysoobtusin, mp. 214°, aurantioobtusin, mp. 265°, from seeds (*Chem. Pharm. Bull.* 1960, 8, 246); new glucoobtusifolin, mp. 205° and glucoaurantioobtusin, mp. 243° (*Syoyakugaku Zasshi* 1963, 17, 43; *Chem. Abstr.* 1965, 62, 5326 h); new glucoside - cassiaside, mp. 256° - characterised as norrubrofusarin-6 β -D-glucoside (*Yakugaku Zasshi* 1966, 86, 1087; *Chem. Abstr.* 1967, 66, 94864 x).

Distribution : Throughout plains of India, in waste places.

NEW COMPOUNDS



Cassiaside



Obtusin

C. obovata (L.) Collad.; see *C. italica* (Mill.) Lam. ex F.W. Andr.

C. occidentalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 54).

Roots contain free (1.9%) and total (4.5%) anthraquinones; a phytosterol, 1,8-dihydroxyanthraquinone, an anthraquinone, mp. 179°, a hydroxyanthraquinone, mp. 128°, emodin, quercetin and a substance similar to rhein isolated (*Anais Fac. Farm. Porto* 1964, 24, 65; *Chem. Abstr.* 1965, 63, 17797 b); dianthronic heteroside from leaves; C-flavonosides of apigenin from pericarp; chrysophanol and emodol from young roots (*Ann. Pharm. Fr.* 1968, 26, 673; *Chem. Abstr.* 1969, 70, 84918 m).

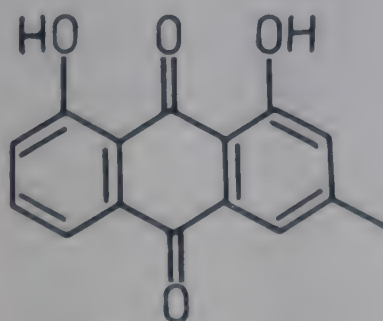
C. senna L. var. *senna* syn. *C. angustifolia* Vahl (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 54).

New glycoside - aloemodin dianthrone diglucoside - from leaves (*Pharm. Acta Helv.* 1967, 42, 37; *Chem. Abstr.* 1967, 66, 49236 h); anthracene glycosides of rhein and chrysophanic acid - sennosides A and B - from pods (*Lloydia* 1962, 25, 238; *J. Pharm. Sci.* 1964, 53, 110).

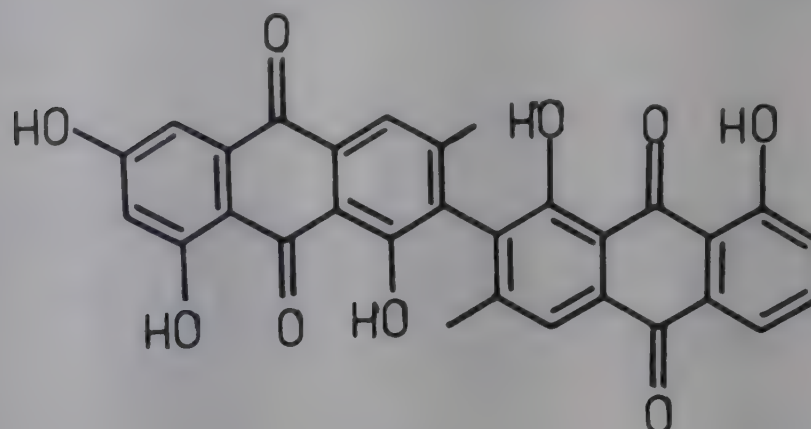
C. siamea Lamk. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 55).

Lupeol, chrysophanol, cassiamin A, mp. 356°, from root bark (*Tetrahedron Lett.* 1964, 3023); dianthraquinone pigments - cassianin, siameanin and siameadin - and several neutral compounds from trunk bark (*Bull. Nat. Inst. Sci. India* No. 31, 1965, 141; *Chem. Abstr.* 1967, 66, 65315 p); lupenone from trunk bark (*J. Indian Chem. Soc.* 1966, 43, 63); 2,3,2',3'-tetrahydrostilbene from heartwood (*Indian J. Appl. Chem.* 1968, 31, 239).

NEW COMPOUNDS



Chrysophanol



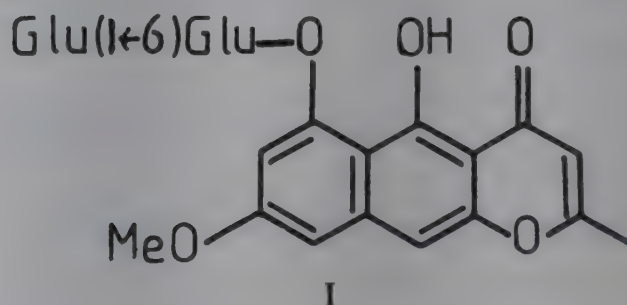
Cassiamin A

C. tora L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 55).

A sterol, mp. 137°, myricyl alcohol, mp. 87° (*Curr. Sci.* 1965, 34, 481); isolation and structure of a new rubrofusarin glycoside (I) (*Chem. Pharm. Bull.* 1969, 17, 458).

Note: *C. tora* L. and *C. obtusifolia* L., two distinct species, are wrongly treated as synonyms in Glossary.

NEW COMPOUNDS



I

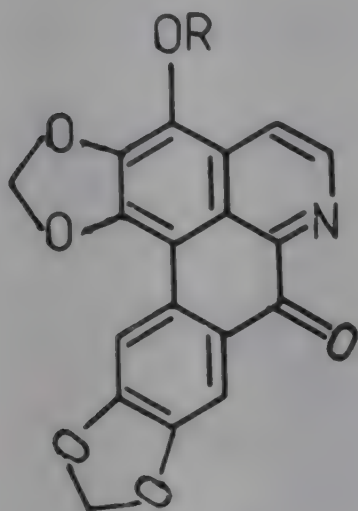
CASSYTHA (Cassythaceae)

C. americana Meissn.; see *C. filiformis* L.

C. filiformis L. syn. *C. americana* Meissn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 55).

13 Alkaloids isolated; of these, structures of two new oxoaporphine bases established - cassamedine as 1,2,9,10-bis(methylenedioxy)-3-methoxydibenzo[de,g]quinolin-7-one and cassameridine as 1,2,9,10-bis(methylenedioxy)-3-hydroxydibenzo-[de,g]quinolin-7-one (*J. Org. Chem.* 1968, 33, 2443); structure of new base - cassyfiline - from Formosan plant (*Yakugaku Zasshi* 1965, 85, 827; *Chem. Abstr.* 1965, 63, 18187 e); isolation and structures of new aporphine bases - cassythine (cassyfiline), mp. 217° and cassythidine, mp. 206° (*Aust. J. Chem.* 1966, 19, 297).

NEW COMPOUDNS

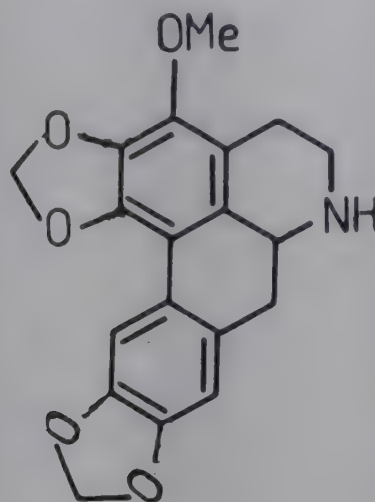


Cassamedine

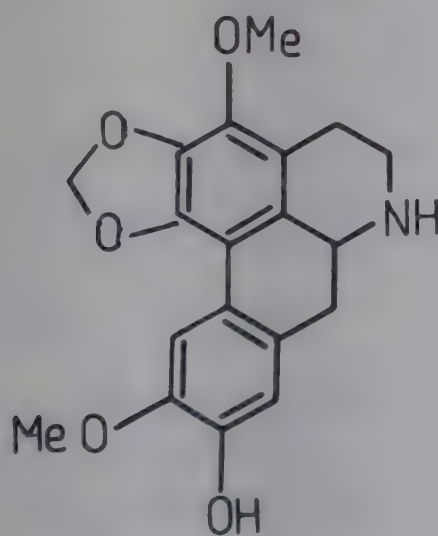
R = Me

Cassameridine

R = H



Cassythidine



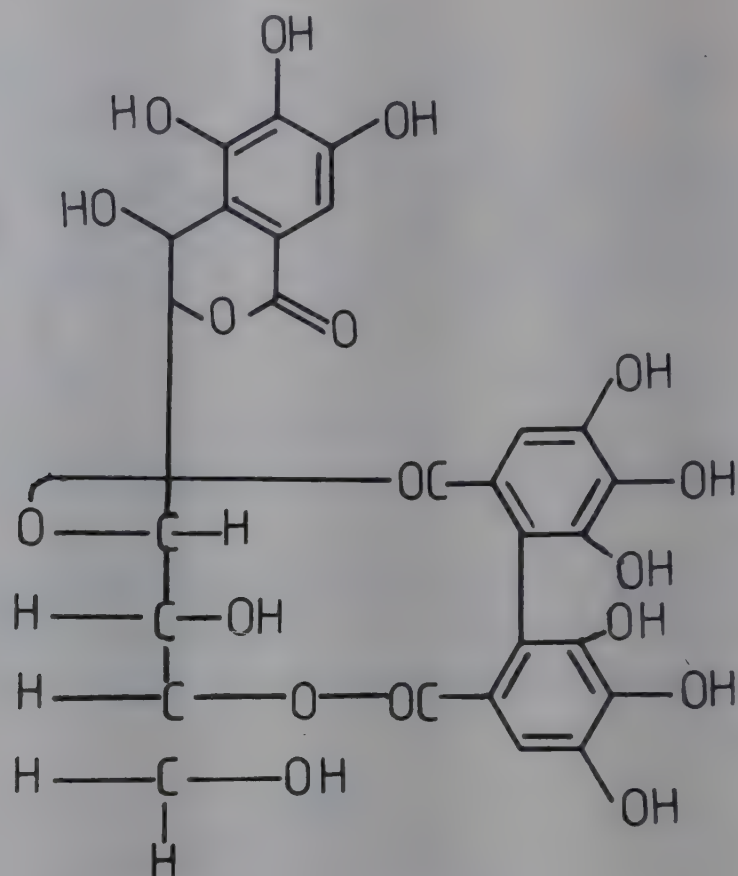
Cassyfiline

CASTANEA (Fagaceae)

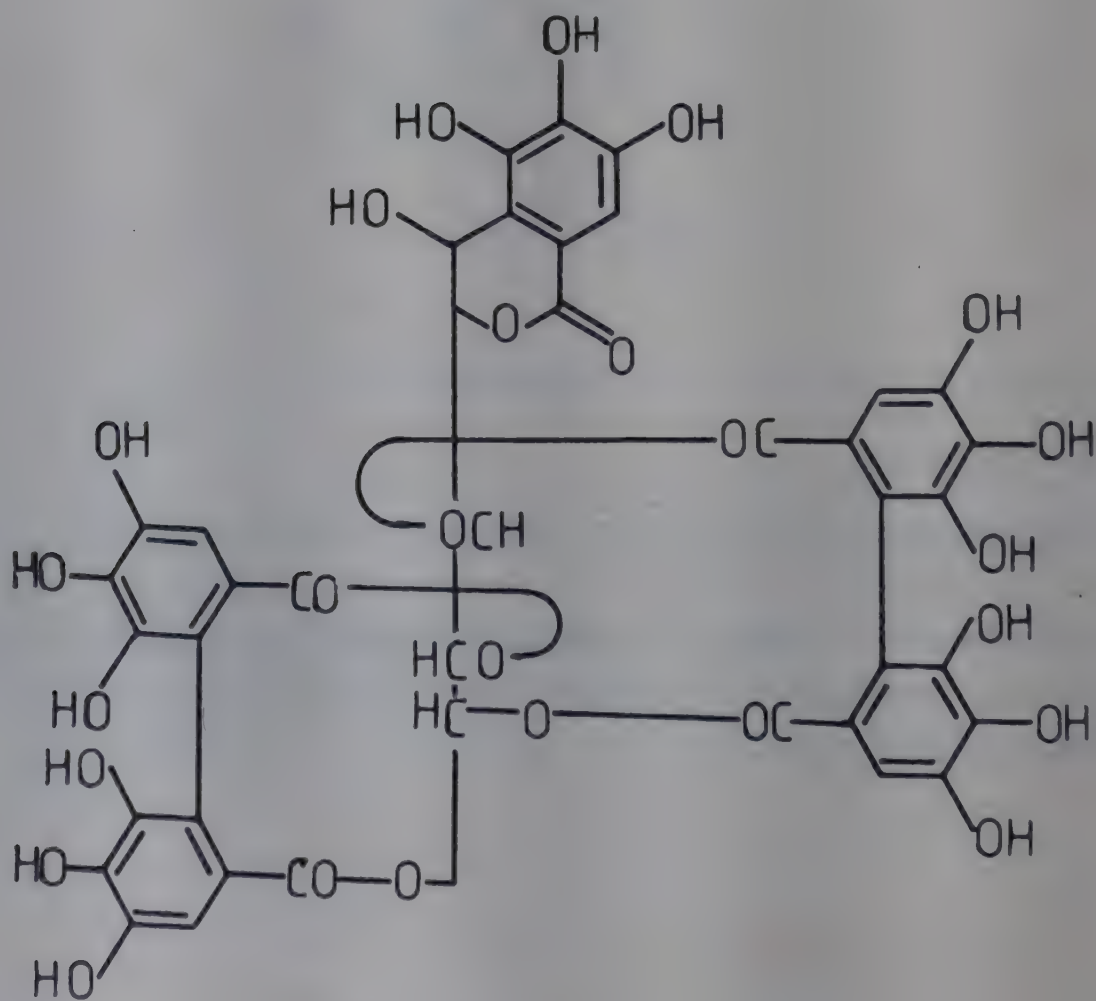
C. sativa Mill. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 55).

Castalin from wood composed of D-glucose and flavogallonic acid (*Ann. Chem.* 1967, 707, 182); isolation and structure of tanning compound - castalagin - from chestnut wood (*Ann. Chem.* 1969, 721, 186).

NEW COMPOUNDS



Castalin

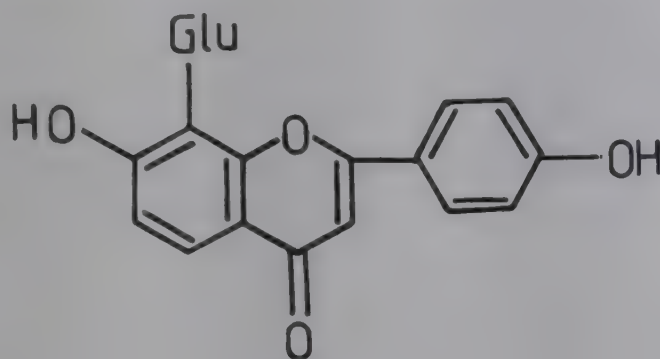


Castalagin

CASTANOSPERMUM (Papilionaceae)

C. australe A. Cunn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 55).

Bayin, mp. 220°, from wood characterised as 5-deoxyvitexin (*Chem. Ind.* 1962, 1720).

NEW COMPOUDNS

Bayin

CATHA (Celastraceae)

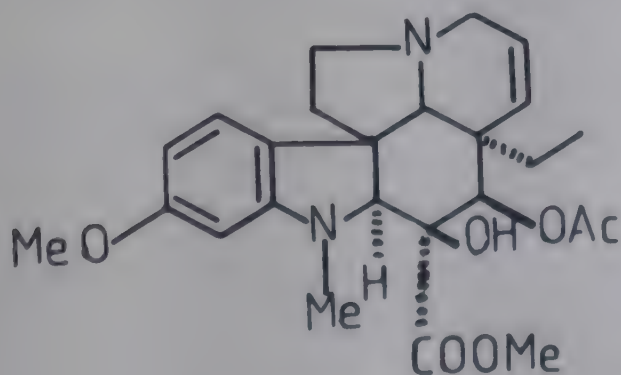
C. edulis Forsk. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 55).

d-Norisoephedrine and 17 amino acids from leaves and young shoots (*Arch. Pharm.* 1960, 293, 991; *Chem. Abstr.* 1961, 55, 67821); cathine (d-norpseudoephedrine), l-ephedrine and a third alkaloid isolated (*Arch. Pharm.* 1962, 295, 524; *Chem. Abstr.* 1962, 57, 13886 h).

CATHARANTHUS (Apocynaceae)

C. pusillus (Murr.) G. Don syn. *Vinca pusilla* Murr., *Lochnera pusilla* (Murr.) K. Schum. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 255).

Ajmalicine, vindorosine and vindoline (*Lloydia* 1965, 28, 354); another substance, mp. 171° (*Tetrahedron Lett.* 1965, 3529).

NEW COMPOUNDS

Vindoline

C. roseus (L.) G. Don syn. *Vinca rosea* L., *Lochnera rosea* (L.) Reichb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 255).

Leaves used in the treatment of diabetes (*Pharm. Zentralhalle* 1967, 106, 285; *Chem. Abstr.*

1967, 67, 67531 a); aqueous extract of fruits and seeds showed hypoglycaemic activity (*Indian J. Med. Res.* 1963, 51, 464).

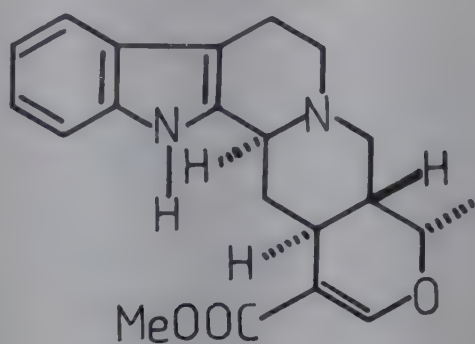
δ -Yohimbine (ajmalicine), mp. 247° from root (*Nagoya Shiritsu Daigaku Yakugakubu Kiyo* 1959, 7, 64; *Chem. Abstr.* 1960, 54, 9004 i); tetrahydroalstonine, mp. 225° (*Chem. Pharm. Bull.* 1959, 7, 613; *Nagoya Shiritsu Daigaku Yakugakubu Kiyo* 1960, 8, 34; *Chem. Abstr.* 1961, 55, 10802 f; *Fitoterapia* 1966, 37, 98; *Diss. Pharm. Pharmacol.* 1967, 19, 213; *Chem. Abstr.* 1967, 67, 29850 w); yohimbine, mp. 253° (*Chem. Pharm. Bull.* 1959, 7, 613; *Nagoya Shiritsu Daigaku Yakugakubu Kiyo* 1960, 8, 34; *Chem. Abstr.* 1961, 55, 10802 f; *Diss. Pharm. Pharmacol.* 1967, 19, 213, 403; *Chem. Abstr.* 1967, 67, 29850 w, 114334 a; *Khim. Prir. Soedin.* 1965, 1, 224; *Chem. Abstr.* 1965, 63, 16396 g); serpentine (*Nagoya Shiritsu Daigaku Yakugakubu Kiyo* 1960, 8, 34; *Chem. Abstr.* 1961, 55, 10802 f; *J. Sci. Ind. Res.* 1961, 20B, 458; *Fitoterapia* 1966, 37, 98); configuration of serpentine (*Ann. Chem.* 1962, 655, 148); three anthocyanins - petudin, malvidin and hirsutidin - along with kaempferol and quercetin identified (*Nature* 1957, 180, 247); vincalukoblastine sulphate, mp. 284°, leurosine (vinleurosine) (*J. Am. Chem. Soc.* 1959, 81, 4754; *Proc. Symp. G. E. C. A. Ist, Paris* 1965, 9; *Chem. Abstr.* 1968, 68, 58398 f; *J. Am. Pharm. Assoc. Sci. Ed.* 1959, 48, 659; *Chem. Abstr.* 1960, 54, 48; *Bull. Soc. Chim. Fr.* 1963, 1509; *Tetrahedron Lett.* 1968, 783; *J. Pharm. Sci.* 1969, 58, 694; *J. Am. Chem. Soc.* 1973, 95, 4990; *Helv. Chim. Acta* 1975, 58, 1560); vinoline, vindoline, mp. 154°, catharanthine, mp. 126°, vindoline hydrochloride, mp. 210°, lochnericine, mp. 190°, vincalukoblastine, mp. 211°, perivine, mp. 180°, virosine, mp. 258° (*Bull. Soc. Chim. Fr.* 1959, 891; *J. Am. Pharm. Assoc. Sci. Ed.* 1959, 48, 659; *Chem. Abstr.* 1960, 54, 6772 e; *J. Am. Chem. Soc.* 1962, 84, 1058, 1509; *Ann. Chim.* 1963, 53, 43; *Chem. Abstr.* 1963, 58, 138; *Bull. Soc. Chim. Fr.* 1963, 1509; *Tetrahedron Lett.* 1964, 2561, 3105; *Lloydia* 1964, 27, 203; *Naturwiss.* 1964, 51, 637; *Chem. Abstr.* 1965, 62, 6802 h; *Tetrahedron Lett.* 1964, 2561; *Lloydia* 1964, 27, 397; *Naturwiss.* 1965, 52, 132; *Chem. Abstr.* 1965, 62, 14748 c; *Lloydia* 1964, 27, 416); crystal structure of perivine (*Chimia* 1964, 18, 173; *Colloq. Int. Centre Nat. Rech. Sci. No. 144*, 1966, 85; *Chem. Abstr.* 1967, 67, 90967 f; *Pharm. Zentralhalle* 1967, 106, 285; *Chem. Abstr.* 1967, 67, 67531 a; *Diss. Pharm. Pharmacol.* 1967, 19, 213; *Chem. Abstr.* 1967, 67, 29850 w; *Quart. J. Crude Drug Res.* 1962, 2, 221; *Chem. Abstr.* 1965, 62, 820 e; *Tetrahedron Lett.* 1967, 811); configuration of catharanthine (*Collect. Czech. Chem. Commun.* 1974, 39, 2258).

Leurocristine (vincristine) (*J. Am. Chem. Soc.* 1962, 84, 1509); isoleurosine, mp. 202° (*J. Pharm. Sci.* 1961, 50, 409; *Bull. Soc. Chim. Fr.* 1963, 1509); lochneridine, mp. 211° (*J. Pharm. Sci.* 1961, 50, 409; *Bull. Soc. Chim. Fr.* 1963, 1509; *Diss. Pharm. Pharmacol.* 1967, 19, 213; *Chem. Abstr.* 1967, 67, 29850 w); sitsirikine, mp. 239° (*J. Pharm. Sci.* 1961, 50, 409; *Tetrahedron Lett.* 1963, 1815; *Bull. Soc. Chim. Fr.* 1963, 1509; *Tetrahedron* 1966, 22, 321); vincamicine, mp. 224°, catharine, mp. 271° and vindolicine, mp. 248° (*J. Pharm. Sci.* 1961, 50, 409; *Bull. Soc. Chim. Fr.* 1963, 1509; *Diss. Pharm. Pharmacol.* 1967, 19, 403; *Chem. Abstr.* 1967, 67, 114334 a; *Plant Med. Phytother.* 1973, 7, 53; *Chem. Abstr.* 1973, 79, 63524 a); leurosidine, (vinrosidine), mp. 208°, leurosine, rovidine and leurocristine (vincristine), mp. 218° (*Lloydia* 1961, 24, 173; *Proc. Symp. G. E. C. A. Ist Paris* 1965, 9; *Chem. Abstr.* 1968, 68, 58398 f; *Lloydia* 1964, 27, 203); stereochemistry of alstonine (*J. Sci. Ind. Res.* 1961, 20B, 458; *J. Am. Chem. Soc.* 1963, 85, 2507;

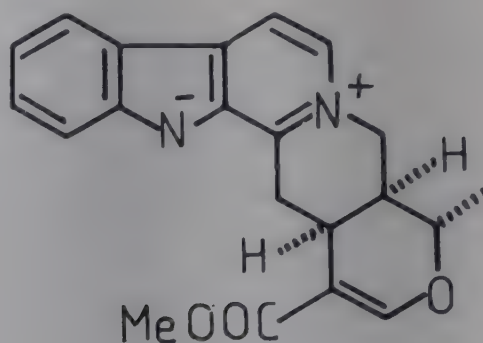
Fitoterapia 1966, 37, 98; *Tetrahedron Lett.* 1967, 811; *Helv. Chim. Acta* 1975, 58, 1560); crystal structure of leurocristine (*J. Am. Chem. Soc.* 1965, 87, 4963); vindolinine, mp. 168° (*Proc. Nat. Acad. Sci. USA* 1962, 48, 113; *Chem. Ind.* 1962, 1425; *Bull. Soc. Chim. Fr.* 1963, 1509; *Diss. Pharm. Pharmacol.* 1967, 19, 213; *Chem. Abstr.* 1967, 67, 29850 w; *Pharm. Zentralhalle* 1967, 106, 285; *Chem. Abstr.* 1967, 67, 17531 a); degradation and absolute configuration of vincamajine, akuammidine, polyneuridine, voachalotine and macusine A (*Bull. Soc. Chim. Fr.* 1962, 1079; *Collect. Czech. Chem. Commun.* 1974, 39, 3168); lochnerinine, mp. 167° (*Chem. Ind.* 1962, 1425; *Tetrahedron Lett.* 1964, 2561; *Lloydia* 1964, 27, 416; *Diss. Pharm. Pharmacol.* 1967, 19, 403; *Chem. Abstr.* 1967, 67, 114334 a); carosidine, mp. 263°, carosine, mp. 214°, pleurosine, mp. 191°, neoleurosine, mp. 219°, vincarodine, mp. 253°, catharicine, mp. 231°, vindolidine, mp. 244° and neoleurocristine, mp. 188° (*J. Pharm. Sci.* 1962, 51, 518; *Chem. Ind.* 1962, 1425; *Bull. Soc. Chim. Fr.* 1963, 1509; *Diss. Pharm. Pharmacol.* 1967, 19, 403; *Chem. Abstr.* 1967, 67, 114334 a); vincarosine (*Quart. J. Crude Drug Res.* 1962, 2, 221; *Chem. Abstr.* 1965, 62, 820 e); vinosidine, mp. 253°, lochnerivine, mp. 278°, leurosivine as sulphate, mp. 335° and cavincine, mp. 275° (*J. Pharm. Sci.* 1963, 52, 407; *Lloydia* 1963, 26, 141).

Mitraphylline, akuammicine, cavincine sulphate, mp. 275°, ammocallin, mp. 335°, pericalline, mp. 196°, ammosine, mp. 221°, perosine sulphate, mp. 219°, cavincidine sulphate, mp. 236°, maandrosine sulphate, mp. 160°, cathindine sulphate, mp. 239° (*Lloydia* 1963, 26, 141); structure of pericalline (*Chem. Commun.* 1978, 947; *J. Chem. Soc. Perkin 2* 1980, 919); vincamicine, mp. 224°, catharine, mp. 171°, vindolicine, mp. 248°, pleurosine, mp. 191°, vincarodine, mp. 253°, catharicine, mp. 231° (*Bull. Soc. Chim. Fr.* 1963, 1509; *J. Pharm. Sci.* 1967, 56, 401); perividine, mp. 211° (*Lloydia* 1963, 26, 243); vinblastine (vincaleukoblastine) and vincristine (*J. Am. Chem. Soc.* 1964, 86, 1440; *Lloydia* 1964, 27, 389, 393); crystal structure of vinblastine and vincristine (*J. Am. Chem. Soc.* 1965, 87, 4963); vincolidine (*Lloydia* 1964, 27, 203); catharosine (*Chem. Ind.* 1965, 1260; *Pharm. Zentralhalle* 1967, 106, 285; *Chem. Abstr.* 1967, 67, 67531 a); vincaleukoblastine, leurosivine, rovidine, dihydrovindolinine and coronaridine (*Proc. Symp. G. E. C. A. Ist Paris*, 1965, 9; *Chem. Abstr.* 1968, 68, 58398 f); citronellyl acetate, an aliphatic compound, bp. 110°/10 mm, cadinene, mp. 220°, an aldehyde, mp. 195°, 2-heptanol (*Perfum. Essent. Oil Record* 1965, 56, 214; *Chem. Abstr.* 1965, 63, 2846 b); dihydrositsirikine and isositsirikine (*Tetrahedron* 1966, 22, 321); raubasine (*Fitoterapia* 1966, 37, 98); cleavamine (*Colloq. Int. Centre Nat. Rech. Sci. No. 144*, 1966, 85; *Chem. Abstr.* 1967, 67, 90967 f); cuamicine (*Diss. Pharm. Pharmacol.* 1967, 19, 213; *Chem. Abstr.* 1967, 67, 29850 w); vindorosine and deacetyl vincaleukoblastine (*Pharm. Zentralhalle* 1967, 106, 285; *Chem. Abstr.* 1967, 67, 67531 a); a review on chemical constituents (*Sci. Ind.* 1967, 5, 137; *Chem. Abstr.* 1968, 68, 93467 z); deoxyvinblastine (isoleurosine) (*Tetrahedron Lett.* 1968, 783); feeding of Na dl-mevalonate-2 ¹⁴C to 1-2 month old shoots provided inter alia radio-active vindoline (*Chem. Commun.* 1965, 538).

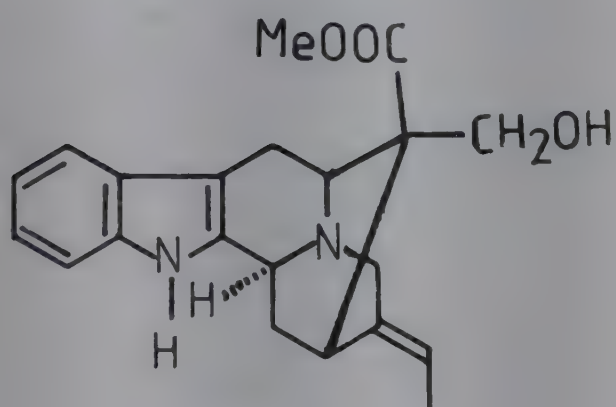
NEW COMPOUNDS



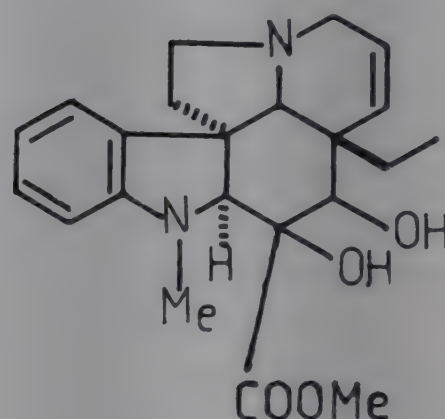
Ajmalicine



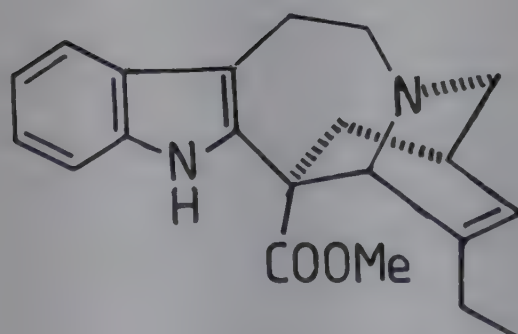
Alstonine



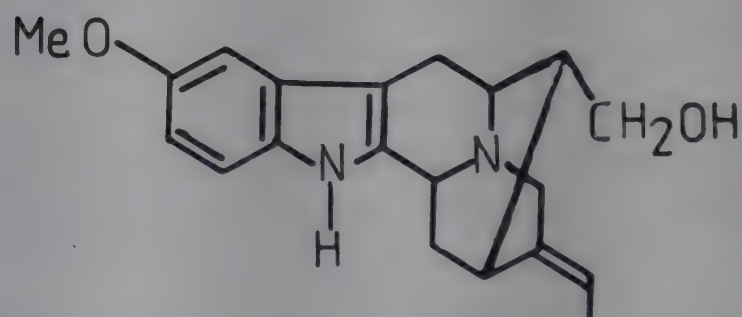
Akuammidine



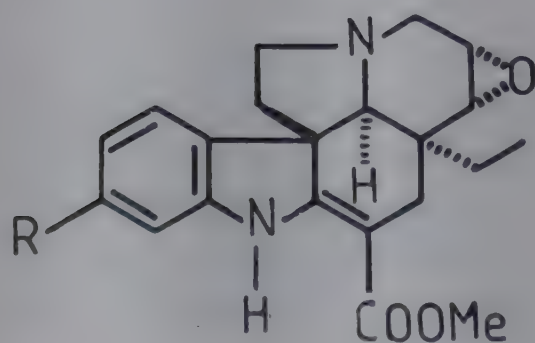
Catharosine



Catharanthine



Lochnerine

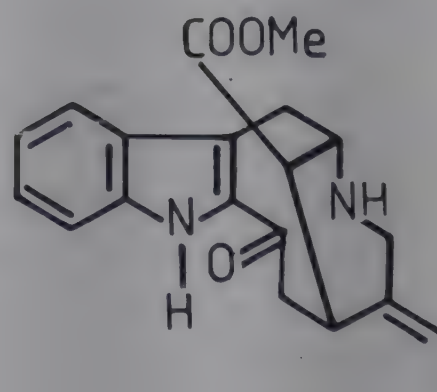


Lochnericine

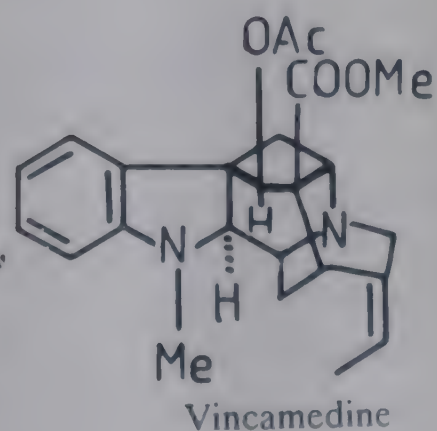
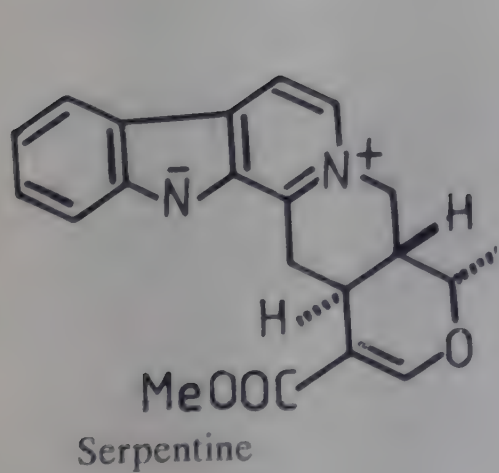
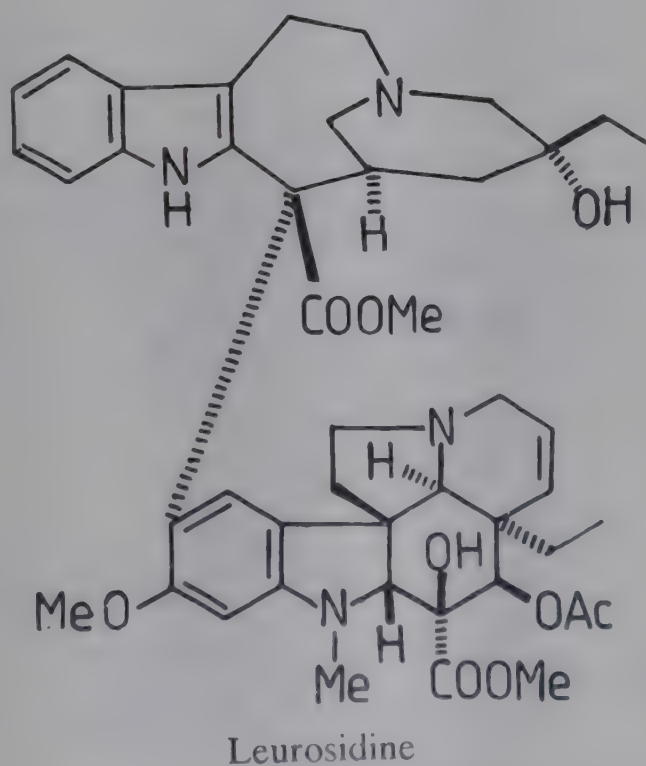
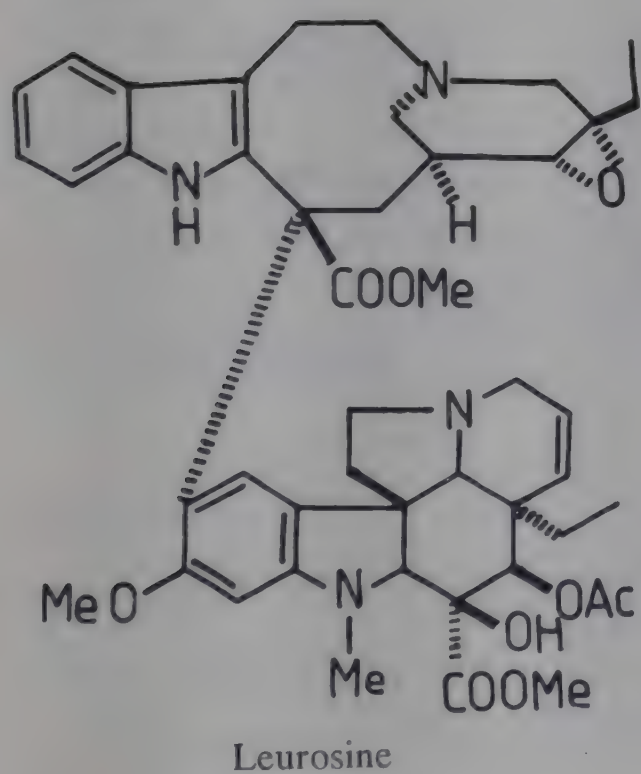
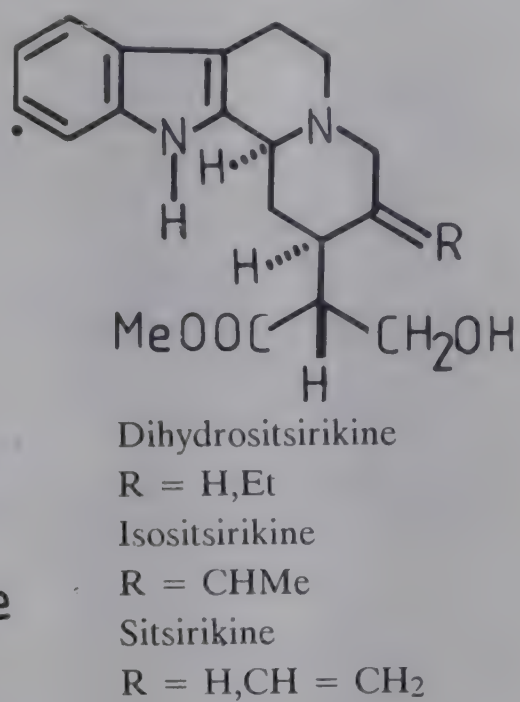
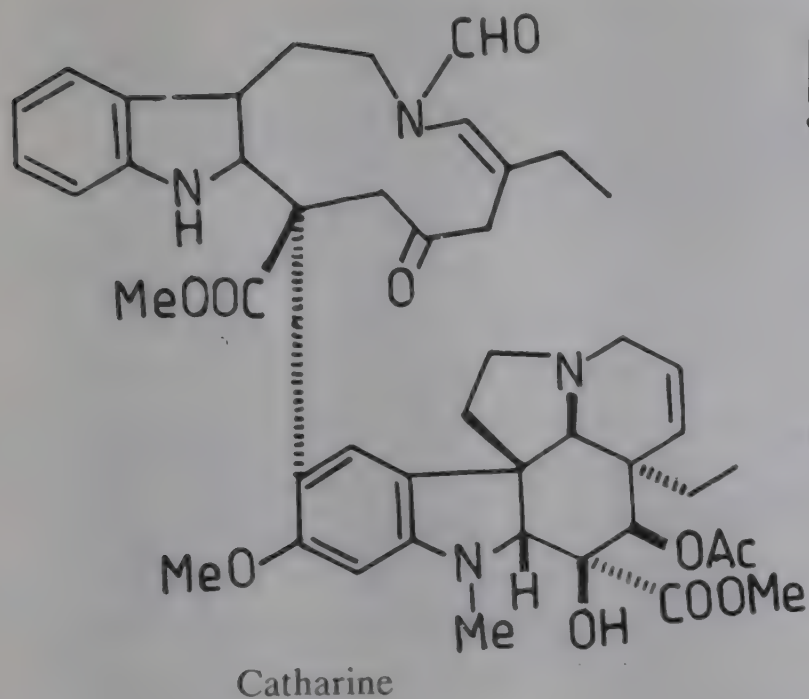
R = H

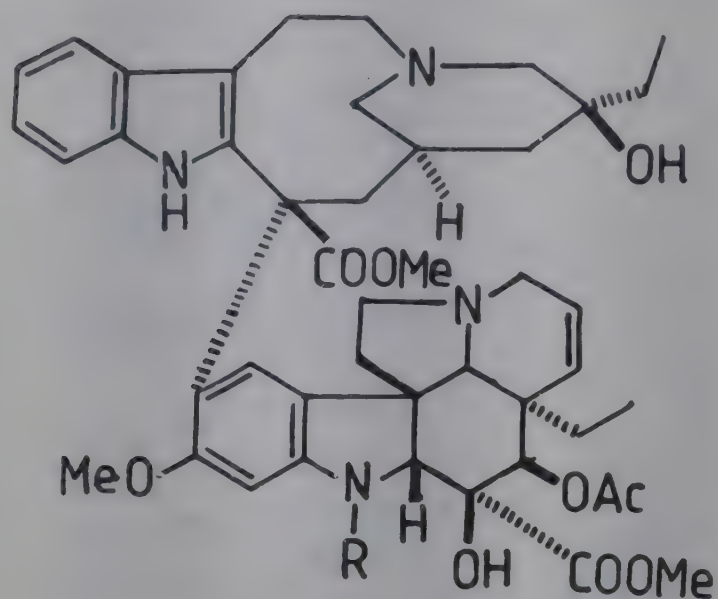
Lochnerinine

R = OMe



Perivine



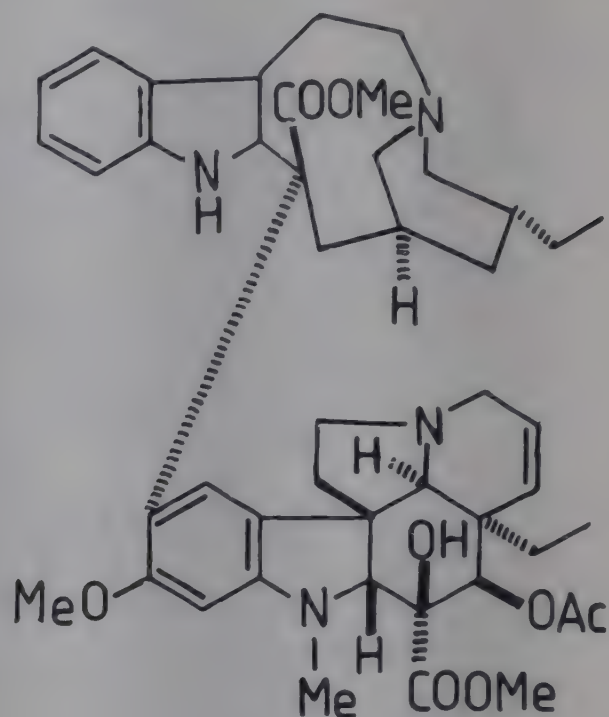


Vinblastine

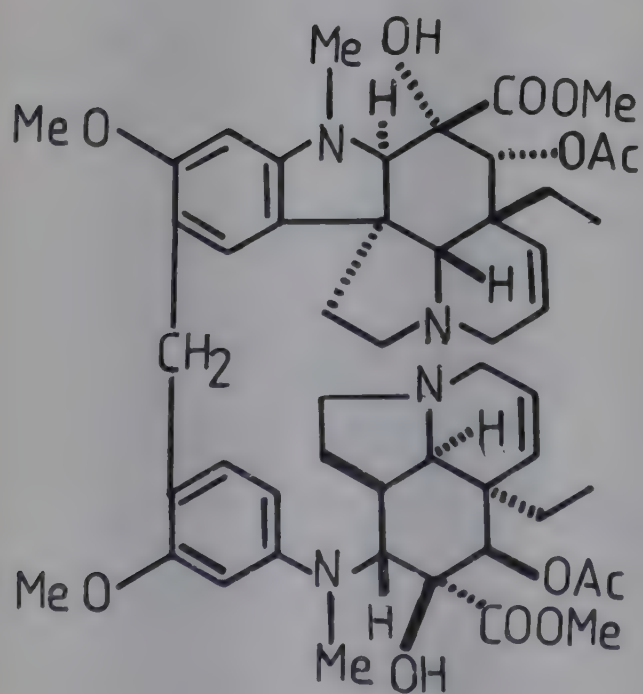
R = Me

Vincristine

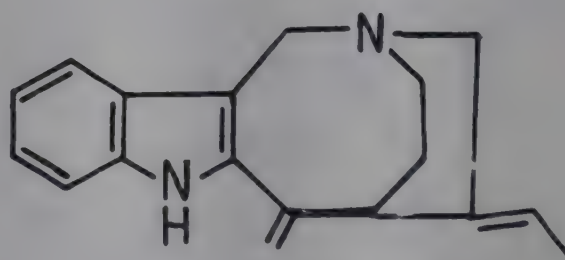
R = CHO



Deoxyvinblastine



Vindolicine



Pericalline

BIOLOGICAL ACTIVITY

Leurosine and vincalukoblastine showed antitumor activity against p-1534 acute lymphocytic leukaemia in mice; they markedly inhibited (s.c.) growth of human choriocarcinoma transplanted into hamster cheek pouch (*J. Am. Pharm. Assoc. Sci. Ed.* 1959, 48, 659; *Chem. Abstr.* 1960, 54, 6772 e; *Cancer Res.* 1960, 20, 1016; *Quart. J. Crude Drug Res.* 1962, 2, 221; *Chem. Abstr.* 1965, 62, 820 c; *Proc. Soc. Expt. Biol. Med.* 1960, 105, 281; *Chem. Abstr.* 1961, 55, 5783 i); crystalline vincalukoblastine preparation (VR-8) was very effective in inhibiting tumor growth and metastasis formation and in prolonging survival time. VR-8 is a very active poison similar to colchicine and has low chemotherapeutic index and LD100 (*Neoplasma* 1963, 10,

149; *Chem. Abstr.* 1964, 60, 1013 h); injection of vincamine (0.6 mg) in rabbits first depressed cholinesterase activity from 0.50 to 0.48 unit for 10 min. and then raised it slightly above normal until the animals died (*Dokl. Akad. Nauk. Uz. SSR* 1961, 28; *Chem. Abstr.* 1962, 57, 7855 i).

Leurosidine and leurocristine were very active against p-1524 leukaemia in DBA/Z mice prolonging survival time indefinitely (*Lloydia* 1961, 24, 173).

Monomeric alkaloids showed diuretic activity (*Lloydia* 1964, 27, 214). After injecting tritiated vinblastine (vincaleukoblastine), less than 1.5% of isotope remained in blood at 30 min. and very little radioactivity was found after 24 hr.; 20-25% of radioactivity was secreted in bile during this period (*Can. J. Physiol. Pharmacol.* 1964, 42, 368); vincaleukoblastine, leurosine, leurocristine, leurosidine, leurosivine and rovidine showed experimental oncolytic activity. Vindoline, dihydrovindolinine and coronaridine produced diuretic and hypoglycaemic effects (*Proc. Symp. G. E. C. A.* Ist Paris, 1965, 9; *Chem. Abstr.* 1968, 68, 58398 f). Vincaleukoblastine and leurocristine were effective against variety of human neoplasms. Catharanthine, leurosine, lochnerine, vindoline and tetrahydroalstonine had hypoglycaemic activity (*Abh. Deut. Akad. Wiss. Berlin, Kl. Chem. Geol. Biol.* 1966, 465; *Chem. Abstr.* 1967, 67, 10249); vincristine sulphate injected i.p. in mice at 0.1-0.5 mg/kg daily produced signs of neurological toxicity by 7th day whereas intracranial injections of 0.3 mg/kg produced neurotoxicity by 4th day. Vinblastine sulphate injected i.p. at 0.1-0.5 mg/kg did not produce obvious signs of neurologic toxicity but only 10% of the mice survived. None of the compounds, at 0.5 mg/kg for 7 days, altered protein synthesis (*Nature* 1967, 215, 965); objective improvements were found in cancer patients in 12 out of 41 (20%) cases with vinblastine sulphate and 10 out of 27 (37%) with vincristine sulphate. In brain tumors, vincristine sulphate was effective in combination with radiologic treatment (*Oncology* 1967, 21, 214; *Chem. Abstr.* 1968, 69, 17967 t).

CAUCALIS (Apiaceae)

C. anthriscus (L.) Clarke; see *Torilis japonica* (Houtt.) DC.

CEDRELA (Meliaceae)

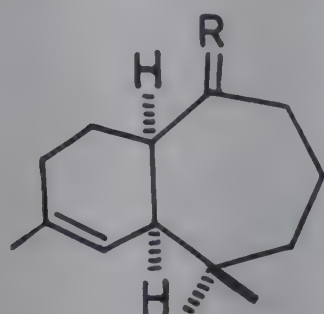
C. toona Roxb. ex Rottl. & Willd.; see *Toona ciliata* M. Roem.

CEDRUS (Pinaceae)

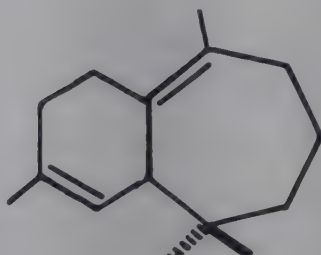
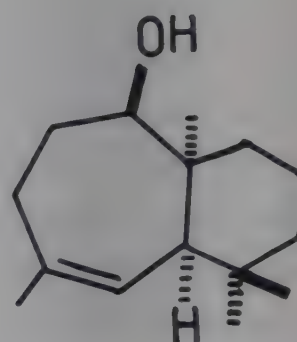
C. deodara (Roxb. ex D. Don). G. Don syn. *C. libani* Barrel var. *deodara* (Roxb. ex D. Don) Hook. f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 56).

Isolation and characterisation of α -himachalene, bp. 93°/2 mm. and β -himachalene, bp. 121°/4 mm., from essential oil (*Tetrahedron Lett.* 1961, 216; *Tetrahedron* 1968, 24, 3809); (+)longiborneol and two new sesquiterpene alcohols - himachalol, mp. 67° and al-lohimachalol, mp. 85° - from essential oil (*Tetrahedron Lett.* 1965, 3761; *Tetrahedron* 1968, 24, 3861; *ibid.* 1968, 24, 3869); deodarin, mp. 248°, from the stem bark (*Tetrahedron* 1965, 21, 3727).

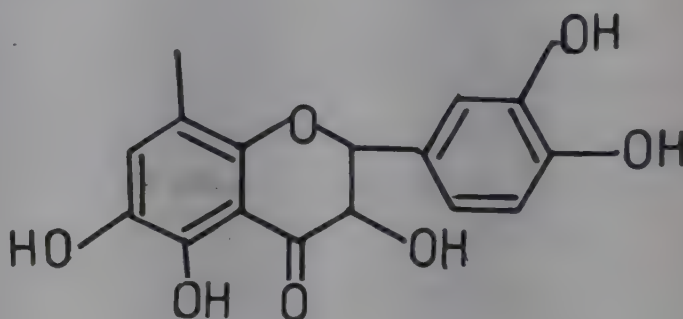
NEW COMPOUNDS

 α -HimachaleneR = CH₂

Himachalol

R = α -Me, β -OH β -Himachalene

Allohimachalol



Deodarin

C. libani Barrel var. *deodara* (Roxb. ex D. Don) Hook.f.; see *C. deodara* (Roxb. ex D. Don) G. Don

CELOSIA (Amaranthaceae)

C. argentea L. var. *cristata* (L.) O. Kuntze syn. *C. cristata* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 57).

Celosianin and isocelosianin found to be 10-coumaroyl-betanicin-5-O-glucuronosylglucoside and 10-feruloyl-isobetanidine-5-O-glucuronosylglucoside respectively (*Phytochemistry* 1966, 5, 1037).

C. cristata L.; see *C. argentea* L. var. *cristata* (L.) O. Kuntze

CELTIS (Ulmaceae)

C. australis L.; see *C. caucasica* Willd.

C. caucasica Willd. syn. *C. australis* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 57).

Betulin, 3,3'-di-O-methylellagic acid, gallic acid and quebrachilol isolated from bark (*Indian J. Chem.* 1968, 6, 231).

CENCHRUS (Poaceae)

C. biflorus Roxb.; see *C. setigerus* Vahl

C. ciliaris L. syn. *Pennisetum centuroides* Rich.

A cyanidin diglycoside isolated (*J. Sci. Ind. Res.* 1962, 21B, 591).

Distribution : Hotter and drier parts of India.

C. setigerus Vahl syn. *C. biflorus* sensu Hook.f. (non Roxb.)

A diglycoside of cyanidin isolated (*J. Sci. Ind. Res.* 1962, 21B, 591).

Distribution : North-west India.

CENTAUREA (Asteraceae)

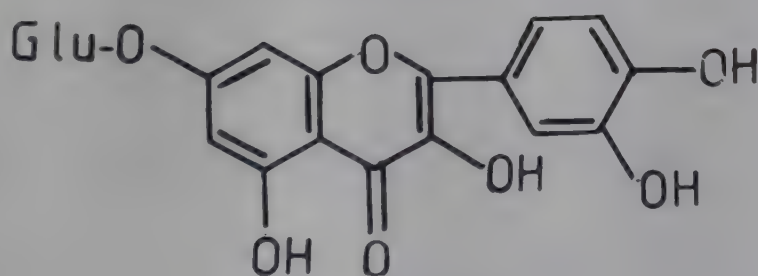
C. calcitrapa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 58).

Cnicin was identified in foliage by TLC (*Diss. Pharm. Pharmacol.* 1967, 19, 233; *Chem. Abstr.* 1967, 67, 41013 h).

C. cyanus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 58).

Cyanidin and delphinidin monoglycosides (*J. Sci. Ind. Res.* 1962, 21B, 591); quercimeritrin from aerial parts (*Khim. Prir. Soedin.* 1967, 3, 58; *Chem. Abstr.* 1967, 66, 112932 z); blue pigment of petals identified as Fe complex of cyanidin - 3,5-diglucoside (4 mols) and bisflavone-glucoside (3 mols) (*Phytochemistry* 1967, 6, 577).

NEW COMPOUNDS



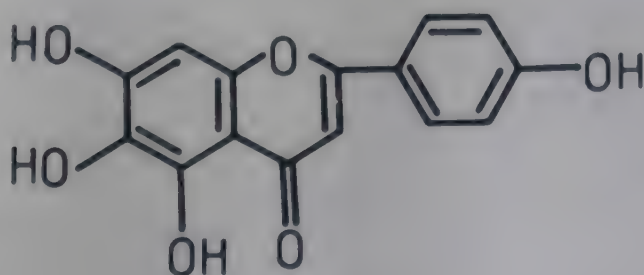
Quercimeritrin

C. depressa M. Bieb.

Scutellarein obtained and six other flavonoids identified in aerial parts by PC (*Khim. Prir. Soedin.* 1967, 3, 57; *Chem. Abstr.* 1967, 66, 112931 y).

Distribution : North-west Himalayas and temperate regions.

NEW COMPOUNDS



Scutellarein

C. iberica Stev.

Cnicin identified in foliage by TLC (*Diss. Pharm. Pharmacol.* 1967, 19, 223; *Chem. Abstr.* 1967, 67, 41013 h).

Distribution : Kashmir, alt. 1500-1800 m.

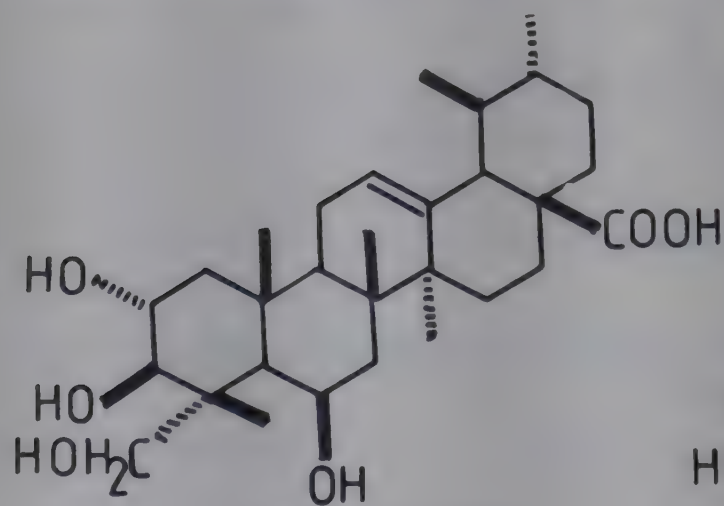
C. picris Pall.; see *Acroptilon repens* (L.) DC.

CENTELLA (Apiaceae)

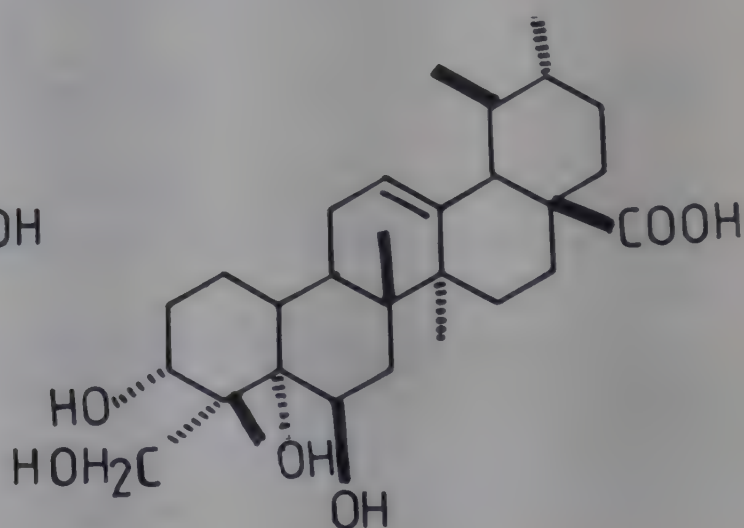
C. asiatica (L.) Urban syn. *Hydrocotyle asiatica* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 58).

Two triterpene acids - brahmic acid, mp. 293° , isobrahmic acid, mp. 263° - and two saponins - brahmoside, mp. 242° and brahminoside, mp. 223° - isolated and studied (*J. Sci. Ind. Res.* 1960, 19B, 252; *Indian J. Chem.* 1963, 1, 267); a new triterpene glycoside - thankuniside, mp. 239° - and a new acid - thankunic acid, mp. 314° - isolated (*J. Sci. Ind. Res.* 1962, 21B, 239); asiatic acid isolated as methyl ester (*Indian J. Chem.* 1967, 5, 586); structure of brahmic acid elucidated as $2\alpha,3\beta,6\beta,23$ -tetrahydroxy-urs-12-en-28-oic acid (*Phytochemistry* 1968, 7, 1385); new triterpene - madecassoside, mp. 220° - and madecassic acid, mp. 265° , isolated and structure of madecassic acid elucidated by chemical studies (*Brit. J. Pharm.* 1968, 1, 123, 288 (1968) Aug. 14; *Chem. Abstr.* 1968, 69, 87240 z; *Bull. Soc. Chim. Fr.* 1967, 1890); new triterpene glycoside - isothankuniside, mp. 250° - isolated and shown to be composed of new isothankunic acid, mp. 288° , glucose and rhamnose (*Indian J. Chem.* 1968, 6, 543; *Bull. Nat. Inst. Sci. India* 1968, No. 37, 178; *Chem. Abstr.* 1969, 71, 61593 h).

NEW COMPOUNDS



Brahmic acid
(Madecassic acid)



Isothankunic acid

CENTROSEMA (Papilionaceae)

C. plumieri (Turpin) Benth.

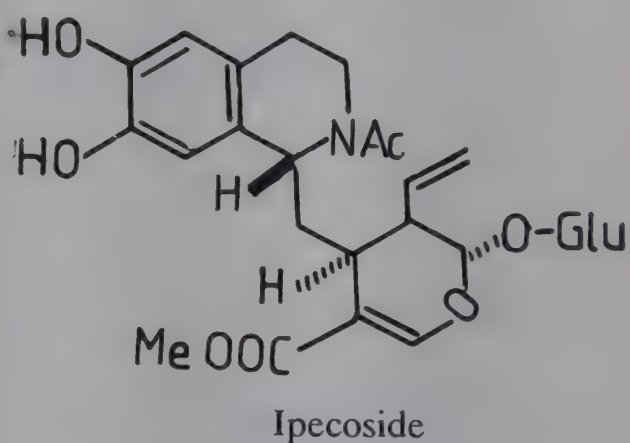
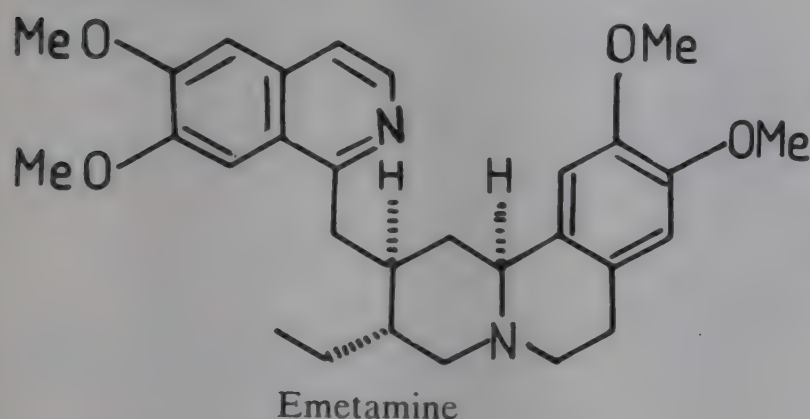
Hydrolysis of gum from seeds afforded galactose and mannose (*Chem. Ind.* 1960, 1419); a polysaccharide from seeds contains D-galactose (92.5%) and L-arabinose (7%) coupled with (1→4) glycosidic linkages (*Can. J. Chem.* 1964, 42, 916).

Distribution : A tropical South American plant, introduced into India as cover crop in rubber, coconut and coffee plantations and as green manure.

CEPHAELIS (Rubiaceae)

C. ipecacuanha (Brot.) A. Rich. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 59).

Structure and stereospecific synthesis of (+)emetamine (*J. Chem. Soc.* 1961, 3899); isolation and structure elucidation of a neutral monoterpenoid quinoline glucoside - ipecoside (*Chem. Commun.* 1967, 219); crystal structure of ipecoside (*Chem. Commun.* 1971, 899); chemical correlation of indole and ipecacuanha alkaloids (*J. Chem. Soc. C* 1968, 2467).

NEW COMPOUNDS**CEPHALANDRA** (Cucurbitaceae)

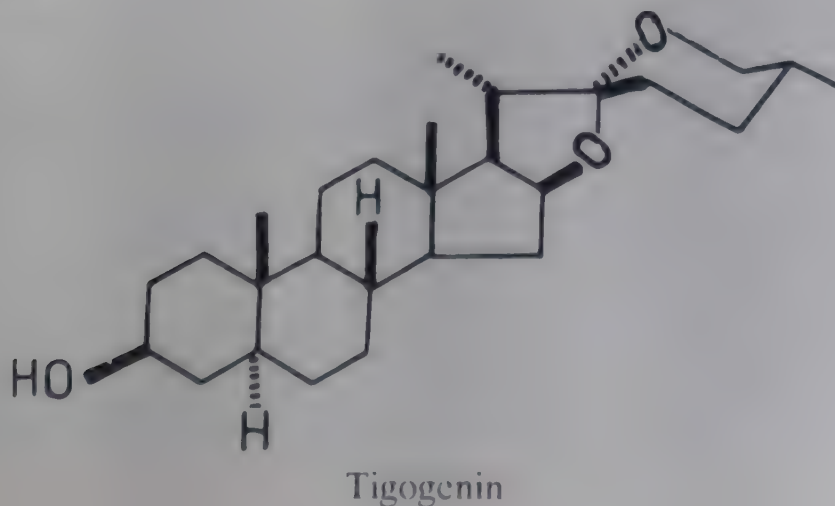
C. indica Naud.; see *Coccinia grandis* (L.) Voigt

CESTRUM (Solanaceae)

C. diurnum L.

A saponin, mp. 269°, from leaves (*Bull. Calcutta Sch. Trop. Med.* 1961, 9, 16; *Chem. Abstr.* 1961, 55, 18885 a); tigogenin, mp. 269° and ursolic acid from leaves (*Experientia* 1964, 20, 200); identification of saponin (*Bull. Calcutta Sch. Trop. Med.* 1962, 10, 123; *Chem. Abstr.* 1963, 59, 706 f).

Distribution : Grown in gardens for its fragrant flowers.

NEW COMPOUNDS

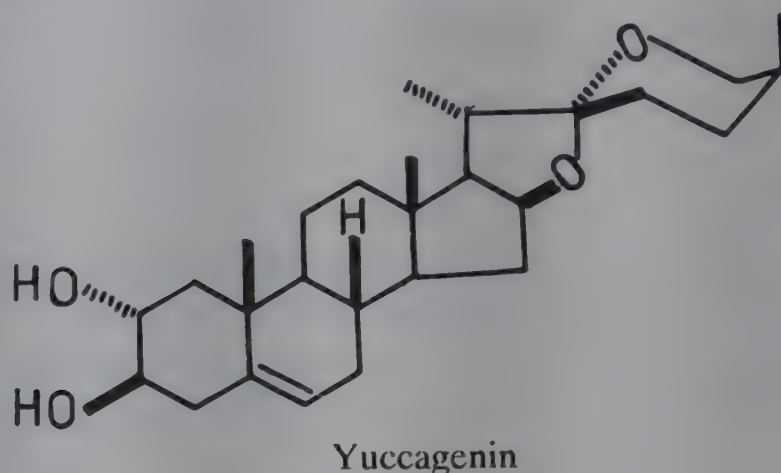
C. nocturnum L.

H. - Raat Ki Rani, Eng. - Lady of night.

Tigogenin (0.04) and yuccagenin (0.5%) (22α -spirost-5-ene- $2\alpha,3\beta$ -diol), mp. 235° from leaves (*Bull. Calcutta Sch. Trop. Med.* 1963, 11, 56; *Chem. Abstr.* 1964, 61, 3413 e).

Distribution : Grown in gardens for its fragrant flowers.

NEW COMPOUNDS



CETRARIA (Parmeliaceae)

C. nivalis (L.) Ach.

A triterpenoid ketol isolated and identified as 22α -hydroxy-stictan-3-one (*Phytochemistry* 1977, 16, 608).

Distribution : Reported from Mt. Everest, Nepal.

CHAEROPHYLLUM (Apiaceae)

C. villosum Wall. ex DC.

Essential oil contains β -pinene, 3-carene and β -phellandrene (*Indian Perfum.* 1960, 4, 119; *Chem. Abstr.* 1962, 56, 10301 d).

Distribution : Himalayas, from Kashmir to Sikkim, alt. 1500-3600 m. and Khasi Hills, 1200-1800 m.

CHAMAECYPARIS (Cupressaceae)

C. lawsoniana (Murr.) Parl.

Eng. - Lawson cypress, Port orford cedar.

Presence of cyanidin-3-rhamnoside and quercitrin (*Morris Arbor. Bull.* 1966, 17, 50; *Chem. Abstr.* 1966, 65, 20510 c).

Distribution : Introduced in Indian gardens on hills as ornamental.

CHEILANTHES (Cheilanthesaceae)

C. farinosa (Forsk.) Kaulf.

Kaempferol, quercetin, 3,7-di- and 7,4'-di-O-methylkaempferol, 3,7,4'-tri-O-

methylkaempferol and 7,4'-di-O-methylapigenin isolated from leaves (*Tetrahedron* 1966, 8, Suppl., 71; *Indian J. Chem.* 1969, 7, 526).

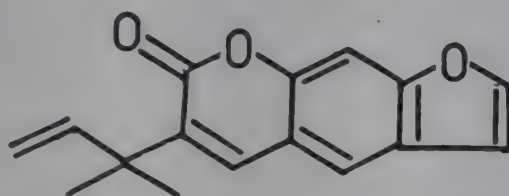
Distribution : Throughout India.

CHLOROXYLON (Rutaceae)

C. swietenia DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 62).

Structure of xylostenin, a new furanocoumarin (*J. Indian Chem. Soc.* 1968, 45, 861).

NEW COMPOUNDS



Xylostenin

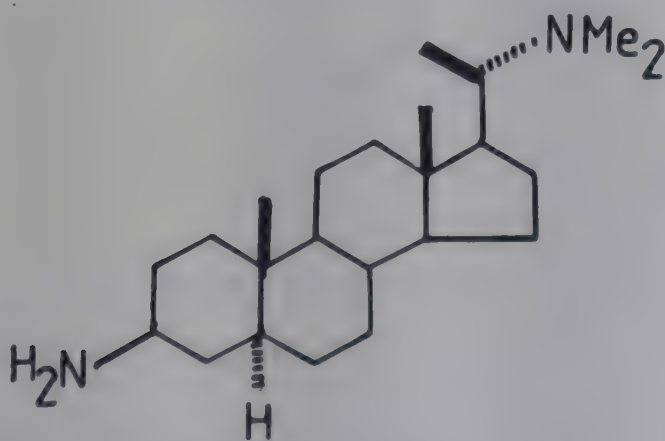
CHONEMORPHA (Apocynaceae)

C. fragrans (Moon) Alston syn. *C. macrophylla* (Roxb.) G. Don

A steroidal alkaloid - chonemorphine, mp. 144° - from roots characterised by spectral and chemical studies (*Chem. Ind.* 1960, 290; *ibid.* 1959, 1445; *Indian J. Chem.* 1967, 5, 146).

Distribution : Moist forests throughout India including Andaman Islands; ascending to 1400 m. in hills.

NEW COMPOUNDS



Chonemorphine

C. macrophylla (Roxb.) G. Don; see *C. fragrans* (Moon) Alston

CHRISTISONIA (Orobanchaceae)

C. bicolor Gardn.

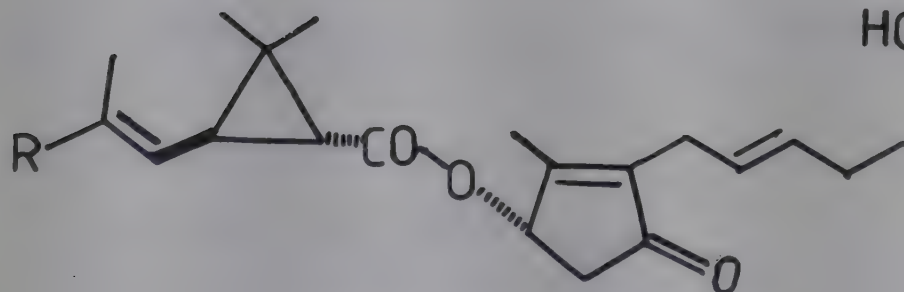
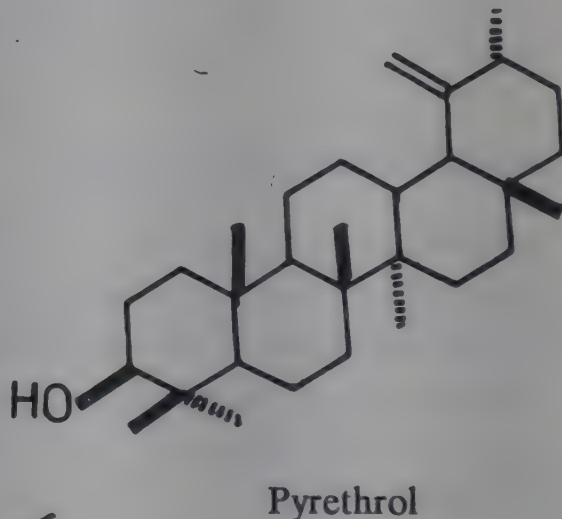
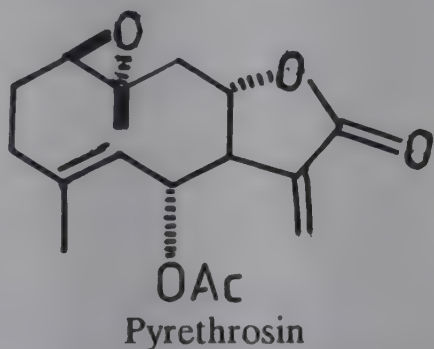
D-Mannitol (0.8%) and a glycoside from rhizomes (*J. Indian Chem. Soc.* 1964, 41, 228).

Distribution : South West India including the Nilgiris, ascending to 900-1200 m.

CHRYSANTHEMUM (Asteraceae)

C. cinerariaefolium (Trev.) Vis. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 62).

Studies in structure determination of pyrethrosin (*J. Chem. Soc.* 1960, 2263); four esters - pyrethrin I, pyrethrin II, cinerin I and cinerin II - collectively known as pyrethrins are the insecticidal constituents of flowers; isolation and structure of new pyrethroids - jasmolin I and jasmolin II (*Chem. Ind.* 1964, 371; *J. Chem. Soc. C* 1966, 332); extraction of pure pyrethrins (*Med. Prom. SSSR* 1966, 20, 35; *Chem. Abstr.* 1966, 65, 20510 b); isolation and structure elucidation of pyrethrosin and pyrethrol (*An. Real Acad. Farm.* 1966, 32, 121; *Chem. Abstr.* 1967, 66, 65658 c; *Ann. Pharm. Fr.* 1967, 25, 121); absolute configuration and crystal structure of pyrethrosin (*Chem. Commun.* 1971, 559).

NEW COMPOUNDS

Jasmolin II
R = COOMe

C. coronarium L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 62).

Seven glucosides of quercetin, quercetagenin and luteolin, a small amount of kaempferol glycoside, chlorogenic and isochlorogenic acids detected in petals (*Arch. Biochem. Biophys.* 1960, 90, 63; *Chem. Abstr.* 1961, 55, 700 f).

C. indicum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 63).

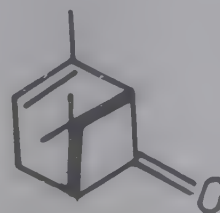
dl-Camphor, azulene and β -3-carene, bp. 70°/30 mm., obtained by distillation of flowers (*Mem. Fac. Sci. Kyushu Univ. Ser. C* 1961, 4, 145; *Chem. Abstr.* 1962, 57, 13902 d); chrysanthemone from essential oil (*An. Real Soc. Espan. Fis. Quim.* 1962, 58, 339; *Chem. Abstr.* 1963,

58, 2319 e); isolation of a new sesquiterpene lactone - yehuja lactone - along with chamazulene from flowers (Yao Hsueh Hsueh Pao 1963, 10, 129; Chem. Abstr. 1963, 59, 15326 b).

NEW COMPOUNDS



β -3-Carene



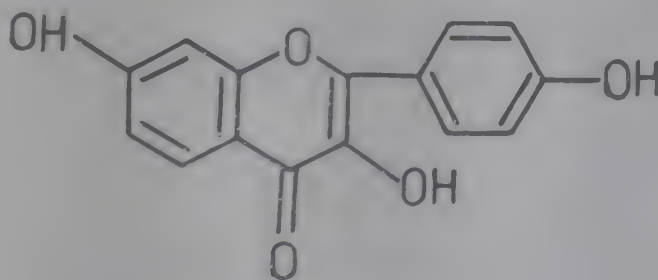
Chrysanthenone

CICER (Papilionaceae)

C. arietinum L. (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 63).

Isoliquiritigenin, isoliquiritigenin-4'-glucoside, 3,4',7-trihydroxyflavone, daidzein, pratensein, p-coumaric acid, garbenzol and biochanin-7-glucoside from seedlings (Phytochemistry 1965, 4, 89).

NEW COMPOUNDS



Garbenzol

CICUTA (Apiaceae)

C. virosa L. (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 64).

γ -Terpinene, β -pinene, p-cymene, myrlimonene, camphene, α -terpinene, β -phellandrene and an unidentified aldehyde indicated by chromatography in essential oil from fruits (Sintetich. Produkty iz Kanifoli i Skipidara, Akad. Nauk Belorussk. SSR, Tsentr. Nauchn. Issled. i Proektn. Inst. Lesokhim. Prom., Tr. Vses. Nauchn. - Tekhn. Soveshch., Gorki 1963, 310; Chem. Abstr. 1965, 62, 8929 b).

BIOLOGICAL ACTIVITY

Cicutotoxin causes paralysis of central nervous system (Sintetich. Produkty iz Kanifoli i Skipidara, Akad. Nauk Belorussk. SSR, Tsentr. Nauchn. Issled. i Proektn. Inst. Lesokhim. Prom., Tr. Vses. Nauchn. Tekhn. Soveshch., Gorki 1963, 310; Chem. Abstr. 1965, 62, 8929 b).

C2261

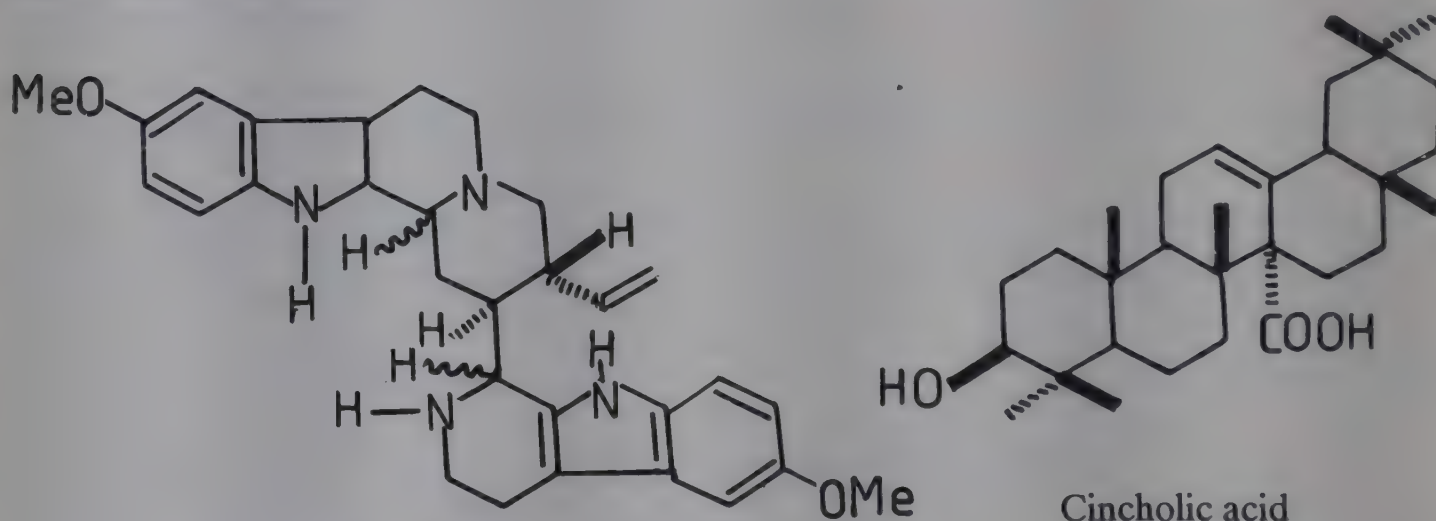
PR 435

COMMUNITY HEALTH CELL
326, V Main, 1 Block
Koramangala
Bangalore-560034

CINCHONA (Rubiaceae)

C. ledgeriana Moens ex Trimen (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 64).

Separation of alkaloids - quinoidine, epiquinine and epiquinidine - and comparison of their chemical properties (*Pharm. Acta Helv.* 1963, 38, 491; *Chem. Abstr.* 1963, 59, 15118 h); constitution of triterpene - cincholic acid - and acidic triterpene glycoside - quinevin - from bark (*Ann. Chem.* 1963, 667, 151); isolation of two stereoisomeric alkaloids - cinchophyllamine and isocinchophyllamine (*Ann. Pharm. Fr.* 1965, 23, 691); structures assigned to cinchophyllamine and isocinchophyllamine (*Bull. Soc. Chim. Fr.* 1966, 2309; *Chem. Abstr.* 1966, 64, 13085 a); crystal structure of isocinchophyllamine (*Acta Crystallog. Sec. B.* 1974, 30, 742).

NEW COMPOUNDS**BIOLOGICAL ACTIVITY**

LD50 values for cinchophyllamine in mice were 56.5 and 66.8 mg/kg i.v. and i.p. respectively. It showed hypothermic and poor sedative effects in mice and did not tranquilise or inhibit barbiturate-induced sleep in guinea pigs, but decreased the toxicity of strychnine and amphetamine (*C.R. Acad. Sci. Paris, Ser. D* 1969, 268, 441; *Chem. Abstr.* 1969, 70, 76301 q).

C. succirubra Pavon ex Klotzsch (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 64).

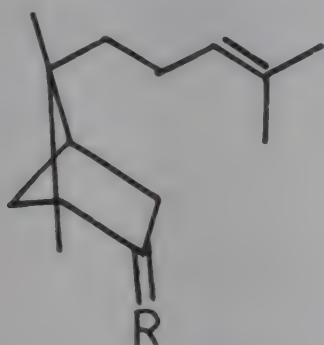
Two alkaloids - succirubin, mp. 80° and methylsuccirubin, mp. 171° - along with quinine, cinchonine, quinidine, cinchonidine and cuperine isolated from bark (*Sci. Res.* 1965, 2, 1; *Chem. Abstr.* 1965, 63, 12004 g).

CINNAMOMUM (Lauraceae)

C. camphora (L.) Sieb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 65).

Two alkaloids - laurilitine (norboldine) and reticuline - isolated as perchlorates from roots (*Yakugaku Zasshi* 1964, 84, 365; *Chem. Abstr.* 1964, 61, 4706 c); sesquiterpenoids - 1- α -ylangene, 1- β -elemene, 1- β -caryophyllene, humulene, selinene and d-nerolidol - from leaf oil and twigs (*Bull. Chem. Soc. Jpn.* 1967, 40, 1003); two new sesquiterpenoids - camphorenone and camphorenol - from essential oil (*Tetrahedron Lett.* 1967, 5069); high boiling fraction of camphor oil contained sesquiterpene hydrocarbons - α -ylangene, β -santalene, δ -guaiene, δ -cadinene, calamenene, calacorene, γ -patchoulene and 1,6-dimethyl-4-isopropyl-7,8-dihydronaphthalene (*Bull. Chem. Soc. Jpn.* 1968, 41, 234).

NEW COMPOUNDS

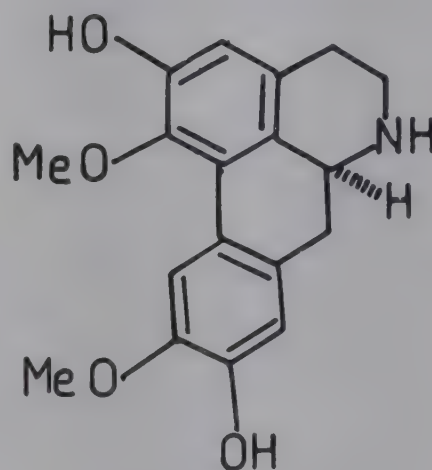


Camphorenone

R = O

Camphorenol

R = H,OH



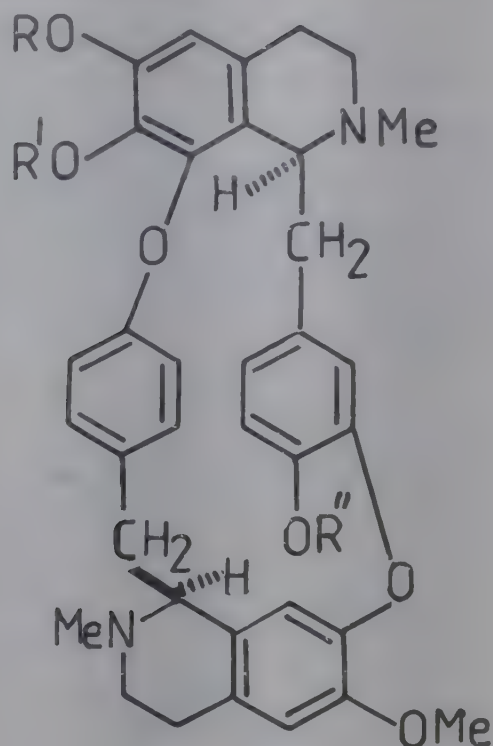
Laurilitine

CISSAMPELOS (Menispermaceae)

C. pareira L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 66).

Hayatin, mp. 298° dec., furnished hydrochloride, picrate, chloroplatinate, methiodide and methochloride; hayatinin furnished HCl and picrate (*Planta Med.* 1959, 7, 250); hayatin, L-curine and d-isochondrodendrine from roots and vines (*J. Am. Pharm. Assoc. Sci. Ed.* 1960, 49, 727; *Chem. Abstr.* 1961, 55, 4887 a); structure of hayatinin, mp. 231°, elucidated (*J. Sci. Ind. Res.* 1962, 21B, 428); root bark showed presence of eleven quaternary alkaloids, three of which were termed menismine, cissamine and pareirine in addition to known 1-bebeerine, hayatinin, hayatin and d-isochondrodendrine, five more tertiary alkaloids present in root bark (*Chem. Ber.* 1964, 97, 2732); a new alkaloid (+ +)-4''-O-methylcurine isolated (*J. Chem. Soc. C* 1966, 615); structure of hayatin established as dl-bebeerine (*J. Org. Chem.* 1967, 32, 819); hayatidin, mp. 179°, identified as dl-4''-O-methylbebeerine (*Experientia* 1967, 23, 242); hayatinin shown to be racemic mixture (*Indian J. Chem.* 1967, 5, 102); cissamine chloride, mp. 215°, was identical with cyclanoline chloride (*Experientia* 1968, 24, 999).

NEW COMPOUNDS



Hayatin

R = Me, R', R'' = H

Hayatinin

(R,S)-form

R, R'' = Me, R' = H

Hayatidin

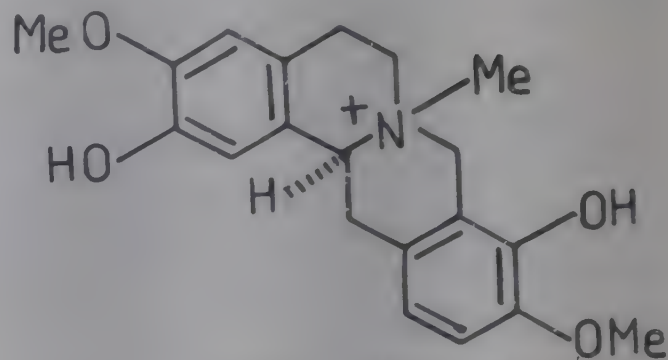
(S,R)-form

R, R'' = Me, R' = H

4''-O-Methylcurine

(S,S)-form

R, R'' = Me, R' = H



Cissamine chloride

BIOLOGICAL ACTIVITY

Hayatin methiodide had muscle relaxant activity similar to that of d-tubocurarine (*Planta Med.* 1959, 7, 250). Hayatin, L-curine and d-isochondrodendrine showed curare-like activity (*J. Am. Pharm. Assoc. Sci. Ed.* 1960, 49, 727; *Chem. Abstr.* 1961, 55, 4887 a).

CISSUS (Vitaceae)

C. quadrangularis L. syn. *Vitis quadrangularis* Wall. ex Wight (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 66).

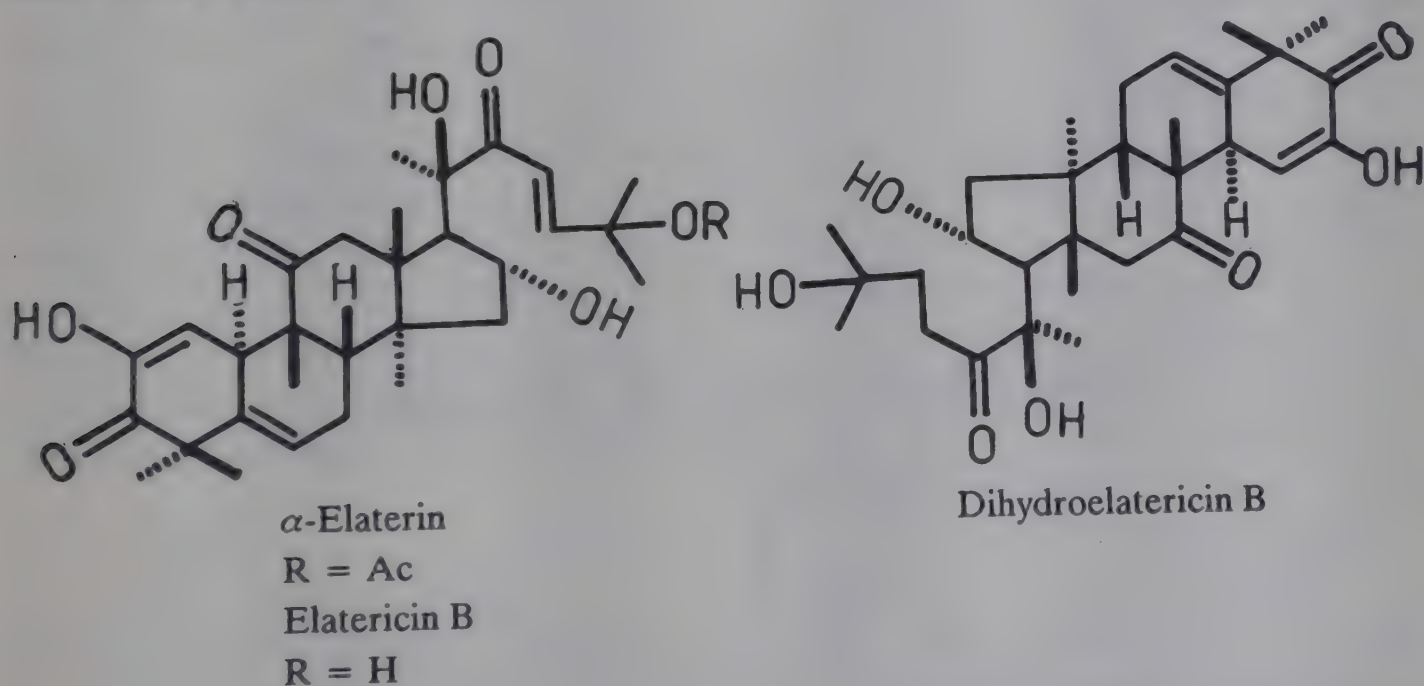
Aqueous extract showed acetylcholine-like activity on isolated ileum of rabbit and rat, uterus of rat, dog tracheal muscle and ileum in situ of dog. The responses on dog blood pressure were analogous to muscarinic and nicotinic actions of acetylcholine. It was ineffective on frog rectus muscle (*Indian J. Med. Res.* 1964, 52, 63).

Two steroidal principles, mp. 249° and 136° isolated but not characterised (*Curr. Sci.* 1966, 35, 317).

CITRULLUS (Cucurbitaceae)

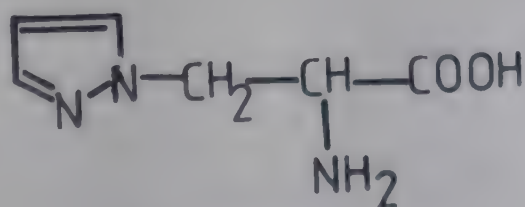
C. colocynthis (L.) Schrad. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 67).

Sterols A, mp. 153° and B, mp. 265° (*Pakistan J. Sci. Ind. Res.* 1960, 3, 13; *Chem. Abstr.* 1961, 55, 18900 h); a bitter oil 'citbittol' isolated (*Igaku to Seibutsugaku* 1959, 51, 52; *Chem. Abstr.* 1962, 56, 3563 d); glucose and α -spinasterol from fruits and fruits and seeds respectively (*J. Sci. Ind. Res.* 1962, 21B, 238); anticancer glycoside - α -elaterin-2-D-glucopyranoside - in addition to α -elaterin (cucurbitacin E) and citrullol from pulp (*J. Chem. Soc.* 1963, 4991); glycosides in fruit composed of elaterin, elatericin B (cucurbitacin I) and dihydroelatericin B (cucurbitacin L) (*Phytochemistry* 1964, 3, 51); a new substance from unripe fruit (*Agric. Biol. Chem.* 1961, 25, 269; *Chem. Abstr.* 1965, 63, 14739 c).

NEW COMPOUNDS

C. lanatus (Thunb.) Mats. & Nakai var. *lanatus* syn. *C. vulgaris* Schrad. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 67).

A new amino acid - β -(1-pyrazolyl) alanine - from seeds (*Nature* 1959, 184, Suppl. B.A. 69).

NEW COMPOUNDS

β -(1-pyrazolyl)alanine

C. vulgaris Schrad.; see *C. lanatus* (Thunb.) Mats. & Nakai var. *lanatus*

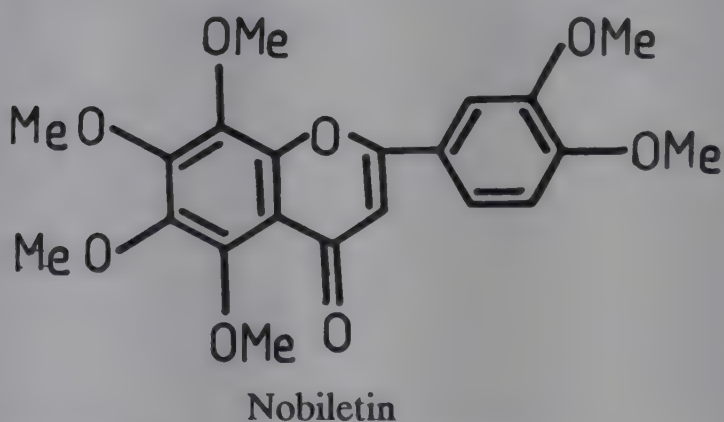
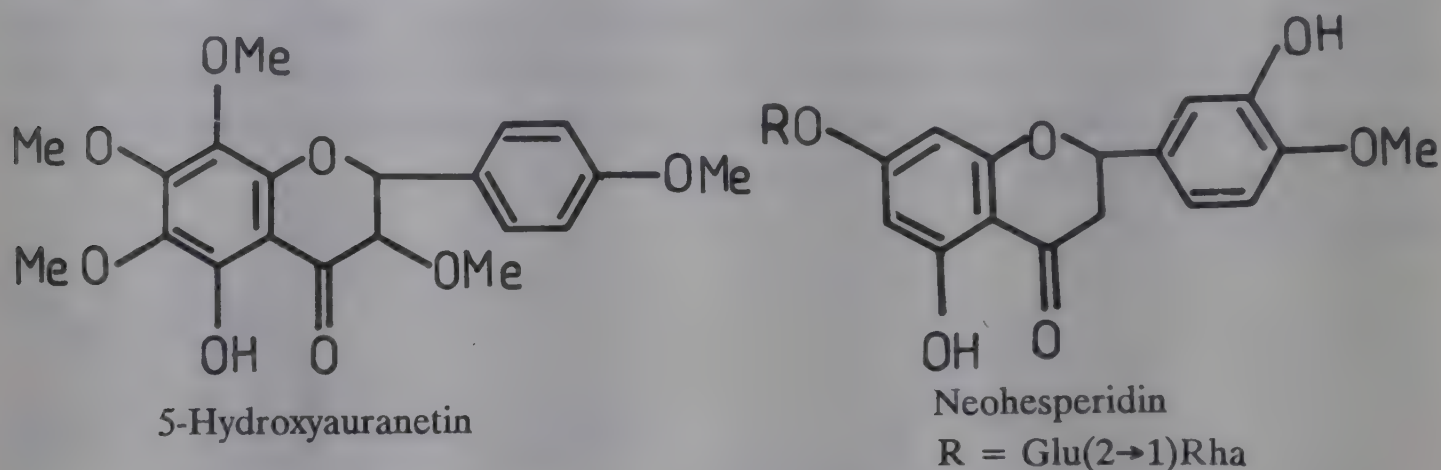
CITRUS (Rutaceae)

C. aurantium L. syn. *C. aurantium* L. var. *bigaradia* Hook.f. (*Glossary Indian Med. Plants*,

Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 68).

5-Hydroxyauranetin, mp. 125°, 5-O-demethylnobiletin, auranetin, mp. 139°, hesperidin, mp. 250°, from peel (*Tetrahedron* 1960, 8, 64); absolute configuration of neohesperidin aglycone, mp. 245° (*Helv. Chim. Acta* 1961, 44, 1413); presence of flavonone glycosides - hesperidin, neohesperidin and limonene - in fruits (*Indian J. Appl. Chem.* 1962, 25, 86); nobiletin, mp. 134° (*Indian J. Chem.* 1964, 2, 462).

NEW COMPOUNDS



C. aurantium L. var. *bigaradia* Hook.f.; see *C. aurantium* L.

C. decumana L.; see *C. grandis* (L.) Osbeck

C. grandis (L.) Osbeck syn. *C. decumana* L.

Naringin and poncirin present in peels (*Bull. Nat. Inst. Sci. India*, No. 31, 1965, 63; *Chem. Abstr.* 1961, 66, 55334 e).

Distribution : Cultivated in the plains.

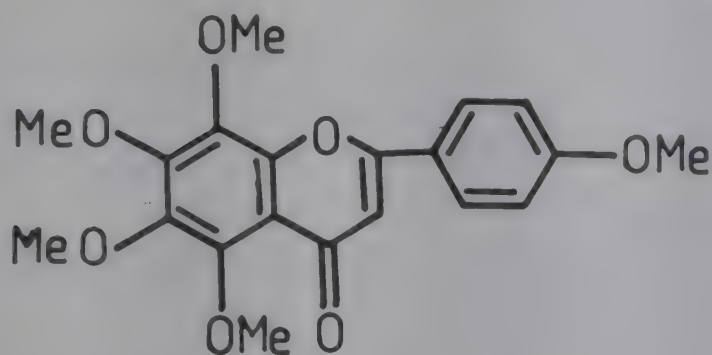
C. jambhiri Lush.

Eng. - Jamberi or Rough lemon.

A new flavone - tangeretin, mp. 150° - along with β -sitosterol, hesperidin and another substance, mp. 176°, from peel oil (*Tetrahedron* 1965, 21, 1441).

Distribution : Grown in Punjab and elsewhere.

NEW COMPOUNDS



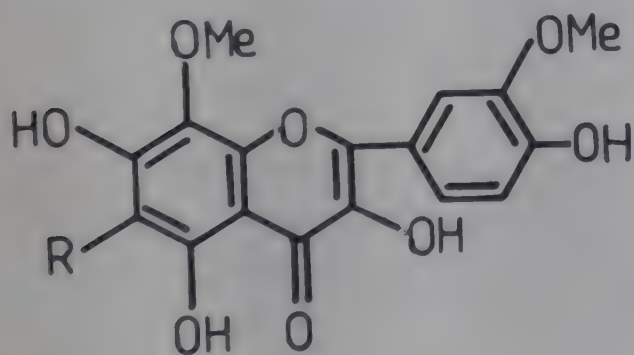
Tangeretin

C. japonica Thunb.; see *Fortunella japonica* (Thunb.) Swingle

C. limon (L.) Burm.f. syn. *C. medica* L. var. *limon* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 68).

Eriocitrin (7-eriodictyol- β -rutinoside) isolated from peel; eriodictyol prepared by hydrolysis of crude mixture of glycosides with hemicellulase (*J. Am. Chem. Soc.* 1960, 82, 2803); apigenin, luteolin, chrysoeriol, mp. 325°, quercetin, isorhamnetin, new flavonols - limocitrin, mp. 271° and limocitrol, mp. 221° - sinapic acid, mp. 192°, p-coumaric acid, scopoletin, mp. 204° and umbelliferone from peels (*J. Org. Chem.* 1960, 25, 2183); limocitrol and isolimocitrol, mp. 221°, isolated (*Tetrahedron* 1964, 20, 2313); peels contain hesperidin (*Bull. Nat. Inst. Sci. India* No. 31, 1965, 63; *Chem. Abstr.* 1967, 66, 55334 e).

NEW COMPOUNDS

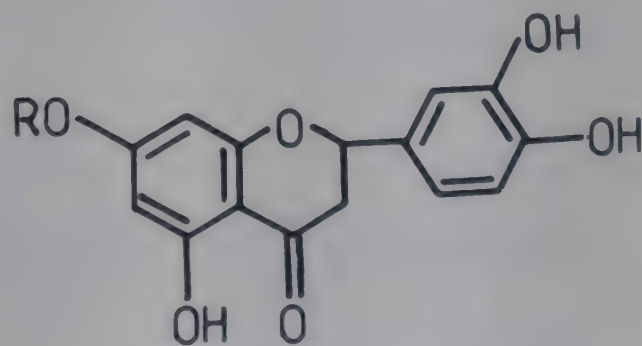


Limocitrol

R = OMe

Limocitrin

R = H



Eriocitrin

R = Rutinose

C. madurensis Lour.; see *C. mitis* Blanco

C. media L. var. *limon* L.; see *C. limon* (L.) Burm.f.

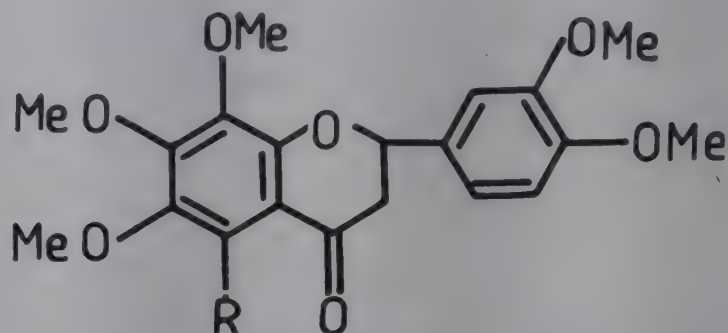
C. mitis Blanco syn. *C. madurensis* Lour.

Hesperidin, hesperetin, glucose and rhamnose from peels (*J. Sci. Ind. Res.* 1960, 19B, 500); two new flavonones - citromitin, mp. 134° and 5-demethylcitromitin, mp. 146° (*J. Sci. Ind. Res.* 1961, 20B, 187; *Tetrahedron* 1961, 15, 111); hesperidin and β -sitosterol glucoside isolated (*J.*

Sci. Ind. Res. 1962, 21B, 343).

Distribution : Cultivated in plains.

NEW COMPOUNDS



Citromitin

R = Me

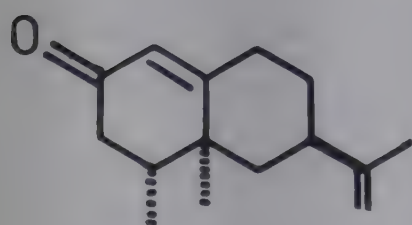
5-Demethylcitromitin

R = OH

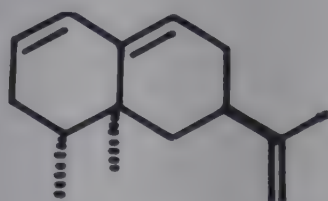
C. paradisi Macf. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 68).

Constitution of sesquiterpene ketones - nootkatone, nootkatene and valencene (*Tetrahedron Lett.* 1965, 4779); new coumarin - 7-(6',7'-dihydroxy-3'-7'-dimethyl-2'-octenyl)oxycoumarin (I) - from peel oil (*Tetrahedron* 1967, 23, 2523); two isomeric glycosides from fruits identified as 4'- β -D-glucosyl-7- β -neohesperidosylnaringenin and 4'- β -D-glucosyl-7-rutinosylnaringenin respectively (*Phytochemistry* 1967, 6, 1305); seselin, a pyranocoumarin from roots (*Phytochemistry* 1969, 8, 1315).

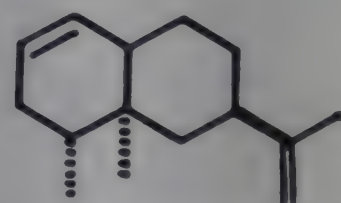
NEW COMPOUDNS



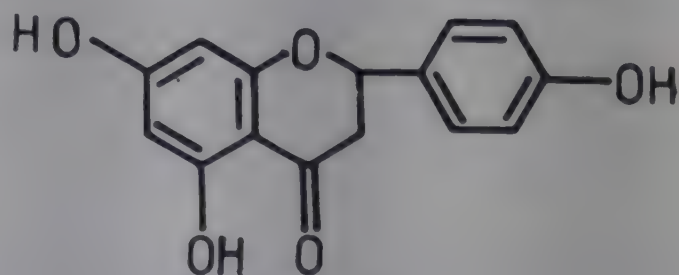
Nootkatone



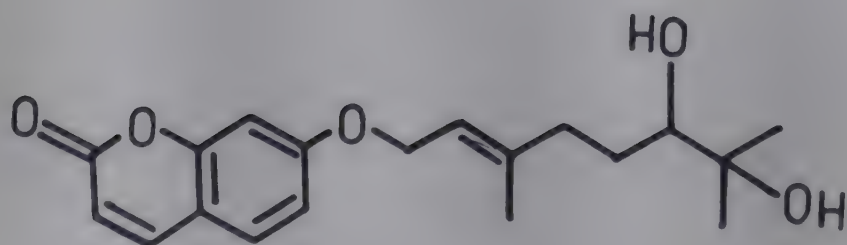
Nootkatene



Valencene



Naringenin

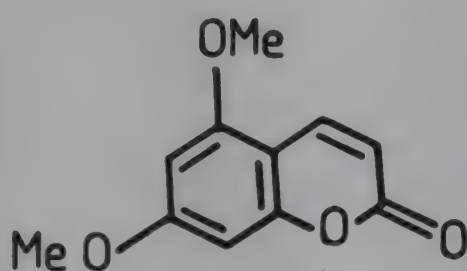


I

C. reticulata Blanco (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 69).

Vacuum distillation of essential oil afforded fraction A containing mixture of β -pinene, dl-limonene and linalool, and another fraction B containing dl- α -terpineol, citropten and an aldehyde (*Indian Oil Soap J.* 1961, 27, 103; *Chem. Abstr.* 1965, 62, 13513 h); tangeretin, mp. 150° , citromitin, mp. 134° , 5-O-demethylcitromitin, mp. 146° , hesperidin and neohesperidin, mp. 242° , from peels (*Indian J. Chem.* 1967, 5, 239); α -pinene, β -pinene, camphene, myrcene, 3-carene, α -phellandrene, β -phellandrene, α -terpene and D-limonene from mandarin oil were characterised (*J. Agric. Food Chem.* 1967, 15, 1044; *Chem. Abstr.* 1968, 68, 10202 k).

NEW COMPOUNDS



Citropten

C. sinensis (L.) Osbeck (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 69).

Nobiletin from peels identified as 3,4,5,6,7,8-hexamethoxyflavone (*J. Org. Chem.* 1960, 25, 2067); 8'-apo- β -carotenal, 2'-apo- β -carotenal, 10-apo- β -carotenal and 3-hydroxy-8'-apo- β -carotenal from fresh fruit peels and juice (*Naturwiss.* 1962, 49, 517; *Chem. Abstr.* 1963, 58, 3265 f); a non-indolic "citrusauxin" isolated (*Phytochemistry* 1965, 4, 203).

CLAUSENA (Rutaceae)

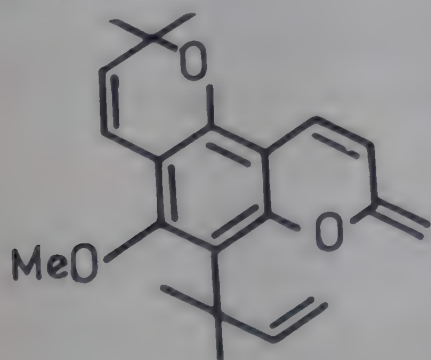
C. dentata (Willd.) M. Roem. syn. *C. willdenovii* W. & A.

Tam. - Potti, Kartukkariveppilai; Mal. - Kariveppila.

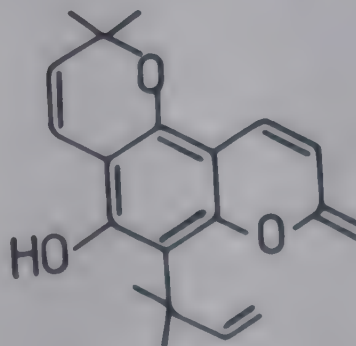
Imperatorin and 2 new coumarins - dentatin and nordentatin - from root bark (*Tetrahedron* 1967, 24, 753).

Distribution : Sikkim Himalayas upto 600 m. southern and western parts of peninsular India ascending to 900 m.

NEW COMPOUNDS



Dentatin



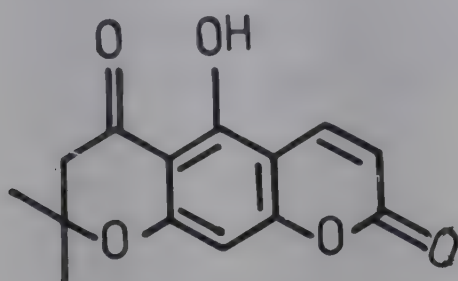
Nordentatin

C. heptaphylla W. & A.

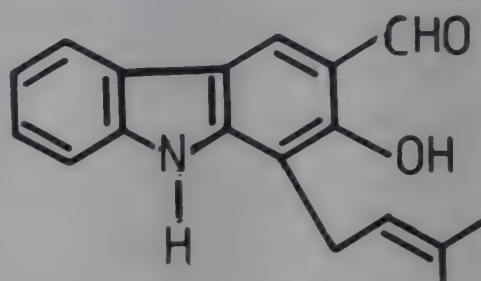
Two new pyranocoumarins - clausenin and clausenidin - isolated from roots and their structures proposed (*Tetrahedron* 1967, 23, 4785); a carbazole alkaloid - heptaphylline, mp. 170° - from roots (*Tetrahedron Lett.* 1967, 4019).

Distribution : Bengal, Khasi Hills, Tamil Nadu, ascending to 1200 m.

NEW COMPOUNDS



Clausenin



Heptaphylline

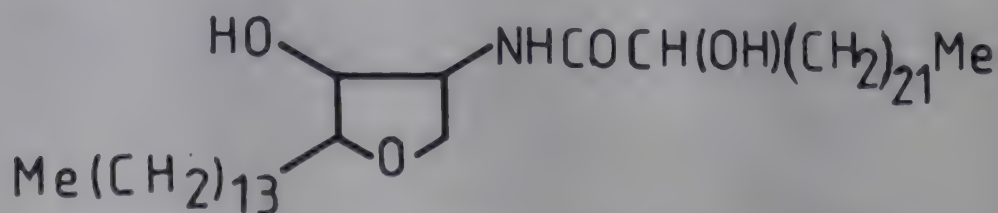
C. willdenovii W. & A.; see *C. dentata* (Willd.) M. Roem.

CLAVICEPS (Clavicipilaceae)

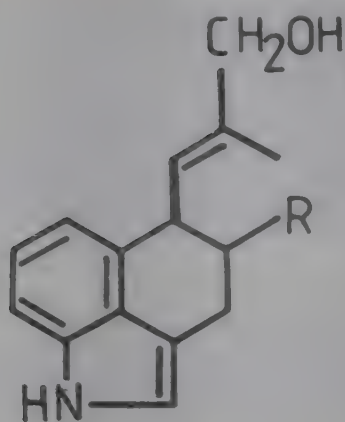
C. purpurea (Fr.) Tul. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 69).

Endocrocin (1,6,8-trihydroxy-2-carboxy-3-methylanthraquinone) and clavorubin from ergot and synthesis of former (*Chem. Ber.* 1960, 93, 347; *ibid.* 1965, 98, 1514); synthesis and stereochemistry of ergotamine (*Experientia* 1961, 17, 206; *Helv. Chim. Acta* 1963, 46, 2306); chrysergonic acid found to be identical with secalononic acid, mp. 268° (*Angew. Chem.* 1961, 73, 494; *Chem. Abstr.* 1962, 57, 8532 g; *Chem. Ber.* 1962, 95, 1328); secalononic acid separated into diastereomeric secalononic acids A and B (*Angew. Chem. Internat. Ed.* 1964, 3, 441); isolation of ergochrysins A and B, ergoflavin, ergoflavinic acid and secalononic acids B and C (*Tetrahedron* 1965, 21, 1417); chemical studies on secalononic acids A and B (*Angew. Chem. Internat. Ed.* 1964, 3, 441); chemical studies on secalononic acids A and B, ergoflavin and other ergochromes (*Tetrahedron Lett.* 1965, 2031); constitution of ergoflavin and its crystal structure (*J. Chem. Soc. C* 1965, 4130; *ibid.* 1966, 18); hydroergotamine, ergotamine, ergosine, dihydroergocristine, dihydroergocornine, dihydroergocryptine, ergocristine, ergocornine, ergocryptine were separated and analysed by PC (*Arch. Pharm.* 1964, 297, 186); chanoclavine, mp. 174° and isochanoclavine, mp. 222°, isolated (*Helv. Chim. Acta* 1964, 47, 2186); a new ergocerebrin and a known cerebrin from ergot residues (*J. Chem. Soc. C* 1965, 4164); chemical studies on ergochrysin A, secalononic acids A and B (*J. Chem. Soc. C* 1965, 4144).

NEW COMPOUNDS



Ergocerebrin

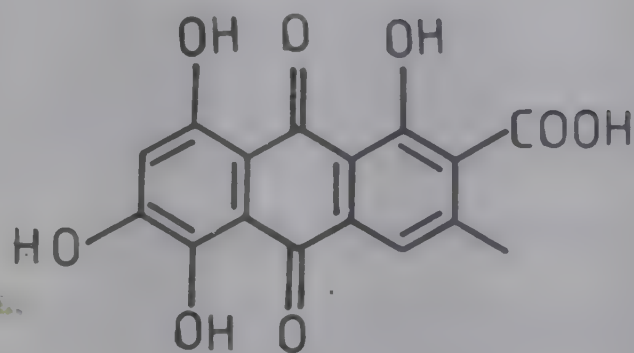


Chanoclavine

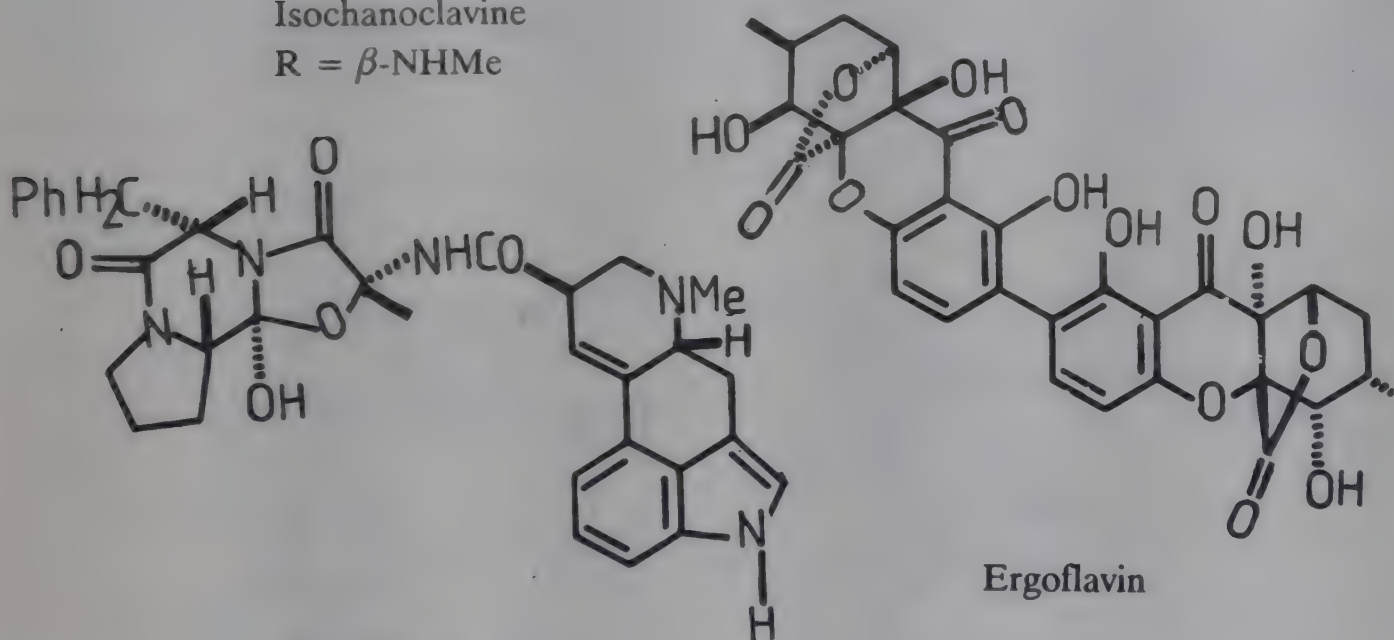
R = α -NHMe

Isochanoclavine

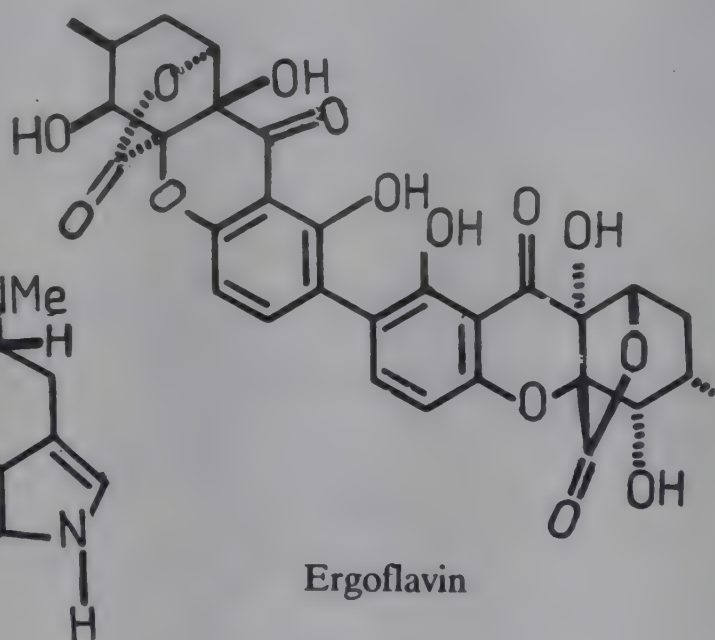
R = β -NHMe



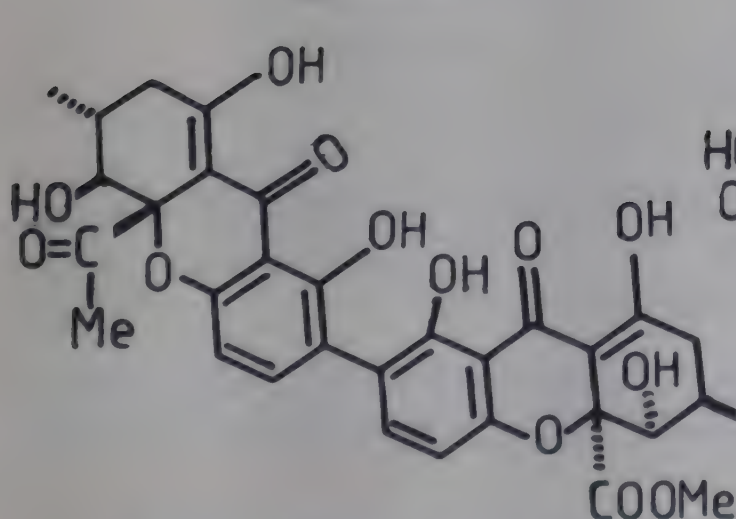
Clavorubin



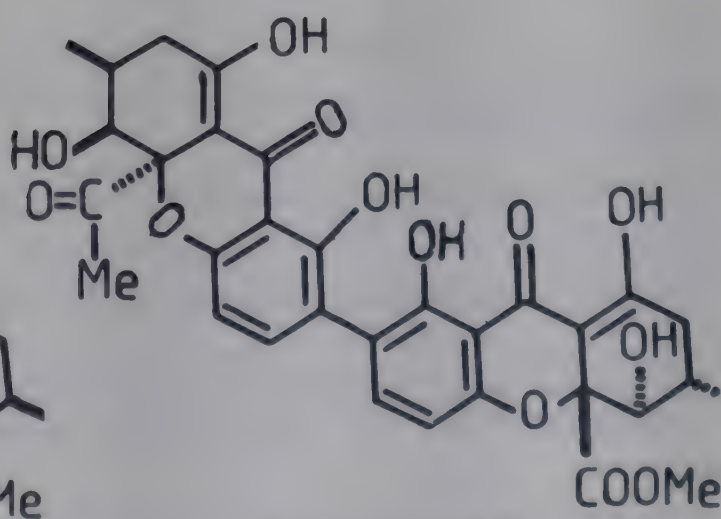
Ergotamine



Ergoflavin



Secalonic acid A



Secalonic acid B

BIOLOGICAL ACTIVITY

Administration of 1 mg/kg ergometrine to rats resulted in biliary excretion of 2 metabolites- β -glucuronides of 12-hydroxyergometrine and 12-hydroxyergometrinine - which were more polar than ergometrine. Similar results were obtained on administration of lysergic acid diethylamide (*J. Med. Pharm. Chem.* 1962, 5, 483).

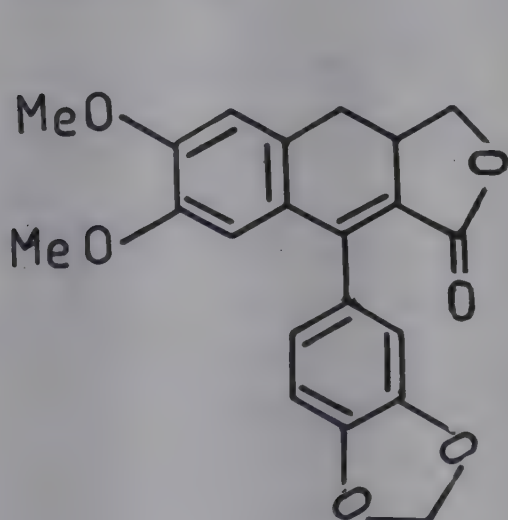
Ergostine showed only 15% of the activity of ergotamine on rabbit uterus. Inhibition by ergostine of the effect of adrenaline on isolated guinea pig seminal vesicle was three times that of ergotamine. LD₅₀ of ergotamine was 3.5 mg/kg and that of ergostine 1.5 mg/kg i.v. in rabbits (*Med. Exp.* 1963, 8, 278; *Chem. Abstr.* 1964, 60, 1005 b); pharmacological properties and uses of ergot alkaloids (*Corriere Farm.* 1967, 22, 148; *Chem. Abstr.* 1967, 67, 89324 n).

CLEISTANTHUS (Euphorbiaceae)

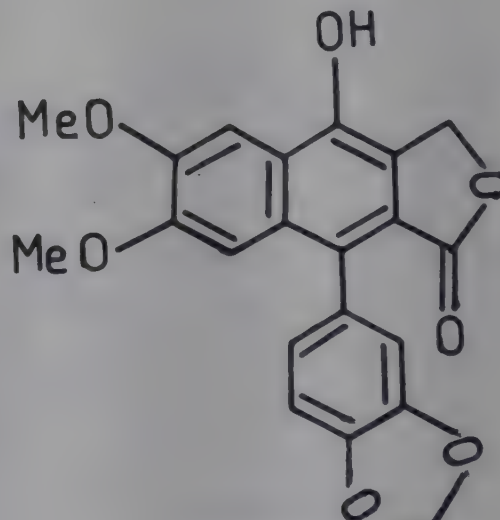
C. collinus (Roxb.) Benth. ex Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 70).

Lupeol and β -sitosterol from fruits (*Curr. Sci.* 1965, 34, 179); ellagic acid and a new new lignan lactone - collinusin, mp. 196° - from leaves (*Tetrahedron Lett.* 1967, 4183); diphyllin and two lignan lactones - cleistanthin (cleistanthin A) and collinusin - isolated (*Tetrahedron* 1969, 25, 2815; *Curr. Sci.* 1970, 39, 395).

NEW COMPOUNDS



Collinusin



Diphyllin

CLEOME (Capparaceae)

C. chelidonnii L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 70).

Rutin isolated from flowers (*Curr. Sci.* 1965, 34, 246).

C. gynandra L. syn. *C. pentaphylla* L., *Gynandropsis gynandra* (L.) Briq., *G. pentaphylla* (L.) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 71 & 129).

β -Sitosterol- β -D-glucoside and kaempferol from seeds (*Indian J. Pharm.* 1968, 30, 127).

C. pentaphylla L.; see *C. gynandra* L.

CLERODENDRUM (CLERODENDRON) (Verbenaceae)

C. infortunatum L.; see *C. viscosum* Vent.

C. multiflorum (Burm.f.) O. Ktze. syn. *C. phlomidis* L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 71).

A monoglucoside, mp. 213° , β - and γ -sitosterols, an unidentified sterol, mp. 155° , ceryl alcohol and palmitic and cerotic acids from leaves (*J. Sci. Ind. Res.* 1962, 21B, 48); D-mannitol, β -sitosterol, β -sitosterol- β -D-glucoside and ceryl alcohol from stem (*Indian J. Pharm.* 1967, 29, 102).

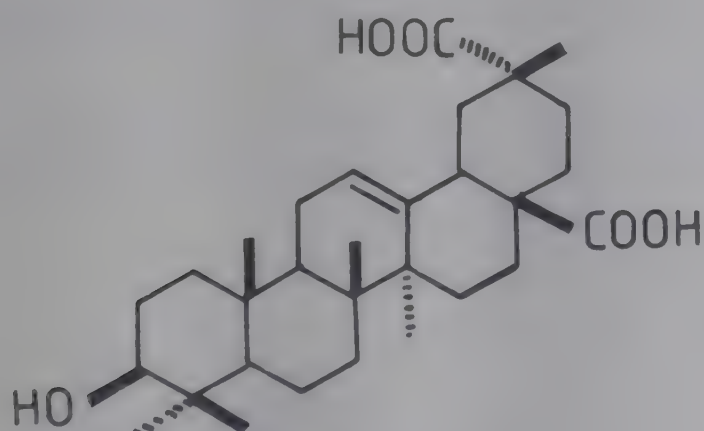
C. phlomidis L.f.; see *C. multiflorum* (Burm.f.) O. Ktze.

C. serratum (L.) Moon (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 71).

Alcoholic extract and saponin isolated from root bark caused release of histamine from lung tissue (*J. Pharm. Pharmacol.* 1968, 20, 801).

Glucose and D-(-)-mannitol from root bark (*Bull. Calcutta Sch. Trop. Med.* 1965, 13, 17; *Chem. Abstr.* 1965, 62, 15068 e); hydrolysis of crude saponin from bark yielded oleanolic acid, queretaroic acid and new serratagenic acid (*Tetrahedron* 1969, 25, 370).

NEW COMPOUNDS

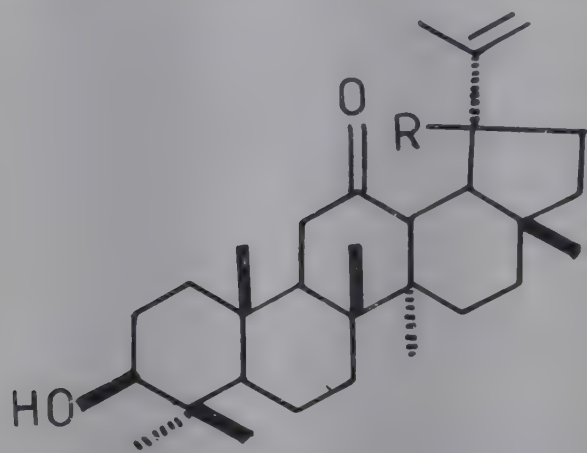


Serratagenic acid

C. viscosum Vent. syn. *C. infortunatum* auct. (non. L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 71).

A diterpene - clerodin, mp. 164° - isolated from leaves and its constitution and stereochemistry elucidated (*J. Chem. Soc.* 1961, 5061); lupeol and β -sitosterol from roots (*Indian J. Chem.* 1964, 2, 172); clerosterol identified as 5,25-stigmastadien- 3β -ol, clerodolone as lup-20(30)-en- 3β ,19-diol-12-one and cleredone as 3β -hydroxy-lupan-12-one (*Tetrahedron* 1966, 22, 2377); a steroidal glycoside, mp. 285° , from roots (*J. Indian Chem. Soc.* 1967, 44, 549).

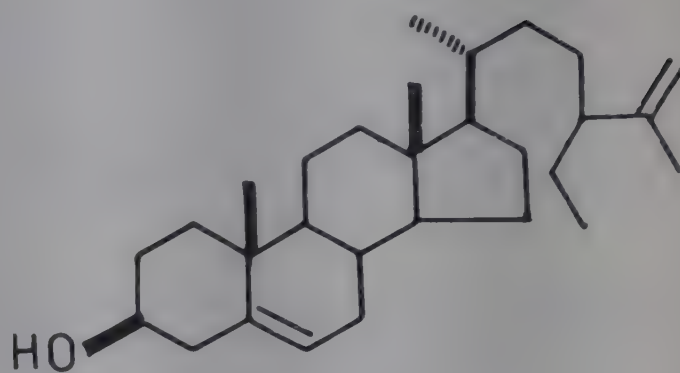
NEW COMPOUNDS



Clerodone

R = H

Clerodolone

R = β -OH

Clerosterol

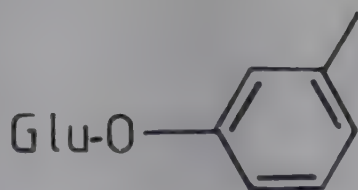
CLEYERA (Theaceae)

C. japonica Thunb. var. *wallichiana* (DC.) Sealy syn. *C. ochracea* auct. (non DC.) inc. var. *lusia* (D. Don) Dyer

A new glycoside - sakakin, mp. 138° - identified as 5- β -D-glucopyranosyl-3-hydroxytoluene from leaves (*Agric. Biol. Chem.* 1968, 32, 599; *Chem. Abstr.* 1968, 69, 97089 w).

Distribution : Kumaon, Nepal and Khasi Hills.

NEW COMPOUNDS



Sakakin

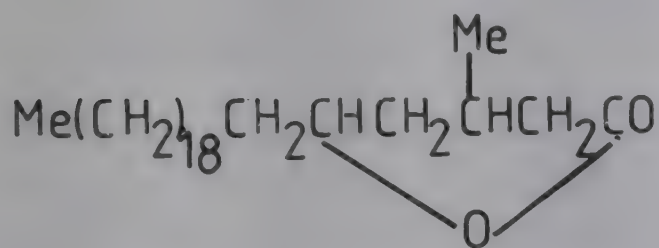
C. ochracea DC.; see *C. japonica* Thunb. var. *wallichiana* (DC.) Sealy

CLITORIA (Papilionaceae)

C. ternatea L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 71).

A lactone - aparajitin, mp. 92° - from leaves (*J. Indian Chem. Soc.* 1959, 36, 243); γ -sitosterol, mp. 145°, from seeds (*Curr. Sci.* 1960, 29, 180); taraxerol from roots (*Bull. Calcutta Sch. Trop. Med.* 1963, 11, 106; *Chem. Abstr.* 1964, 60, 11044 c); a phenol glycoside, 3,5,7,4'-tetrahydroxyflavone-3-rhamnoglycoside, an alkaloid, mp. 235°, ethyl α -D-galactopyranoside and p-hydroxycinnamic acid polypeptide, mp. 210° from defatted seeds (*Curr. Sci.* 1967, 36, 124; *Chem. Ber.* 1968, 101, 2096); hexacosanol, β -sitosterol and an anthoxanthin from seeds (*Indian J. Pharm.* 1968, 30, 167).

NEW COMPOUNDS



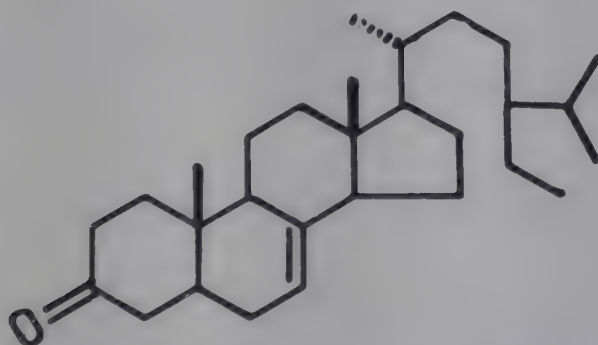
Aparajitin

COCCINIA (Cucurbitaceae)

C. grandis (L.) Voigt syn. *C. indica* W. & A., *Cephalandra indica* Naud. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 72).

An orally effective hypoglycaemic principle, comparable to tolbutamide, isolated from roots (*J. Pharm. Pharmacol.* 1963, 15, 411); β -amyrin, lupeol and a bitter glycoside containing cucurbitacin B, from fruit (*J. Sci. Ind. Res.* 1962, 21B, 237); cephalandrol, mp. 81°, tritriacontane, β -sitosterol, cephalandrine A and cephalandrine B from aerial parts (*Sci. Res.* 1965, 2, 27; *Chem. Abstr.* 1965, 63, 12004 h); stigmast-7-en-3-one, mp. 154°, from roots (*Z. Naturforsch.* B 1968, 23 42; *Chem. Abstr.* 1968, 68, 96043).

NEW COMPOUNDS



Stigmast-7-en-3-one

C. indica W. & A.; see *C. grandis* (L.) Voigt

COCCULUS (Menispermaceae)

C. hirsutus (L.) Diels syn. *C. villosus* (Lamk.) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 72).

The water-soluble fraction of ammoniacal ethanol extract of stems and roots showed sedative, hypotensive, bradycardiac, cardiogenic and spasmolytic actions. It had slight anticonvulsant action but no analgesic and diuretic activities. The hypotensive and bradycardiac actions were not found to be mediated through the nervous system (*Indian J. Med. Res.* 1964, 52, 300).

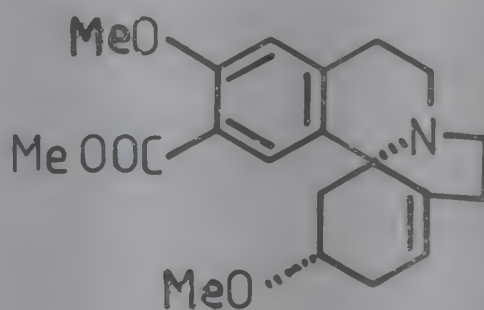
D-Trilobine and DL-coclaurine from roots (*J. Sci. Ind. Res.* 1961, 20B, 125); β -sitosterol, ginnol and monomethyl ether of inositol, mp. 226°, isolated; essential oil, bp. 127° and two alkaloids were also isolated but not characterised (*J. Indian Chem. Soc.* 1962, 39, 411).

C. laeba (Delile) DC.; see *C. pendulus* (J.R. & G. Forst.) Diels

C. laurifolius DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 72).

Synthesis of dl-7-methylcoclaurine (*Yakugaku Zasshi* 1959, 79, 1106; *Chem. Abstr.* 1960, 54, 4637 h); synthesis of dl-4'-methyl-6-demethylcoclaurine (*Yakugaku Zasshi* 1960, 80, 1469; *Chem. Abstr.* 1961, 55, 5561 c); coclanoline shown to be mixture of O,O-diethyl-N-methylcoclaurine and laudanine (*Yakugaku Zasshi* 1961, 81, 1253; *Chem. Abstr.* 1962, 56, 11640 f); isolation and structure of new erythroculine from leaves (*Tetrahedron Lett.* 1969, 153).

NEW COMPOUNDS



Erythroculine

C. pendulus (J.R. & G. Forst.) Diels syn. *C. laeba* (Delile) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 72).

Coclaurine, menisarine, sinactine, a trihydroxy compound, β - and γ -sitosterols and a mixture of fatty acids from leaves (*J. Proc. Inst. Chemists* 1960, 32, 250; *Chem. Abstr.* 1961, 55, 18886 b).

C. villosus (Lamk.) DC.; see *C. hirsutus* (L.) Diels

COCOS (Arecaceae)

C. nucifera L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 72).

Albumin, globulin and prolamine fractions of coconut separated, hydrolysed and amino acids analysed. Albumin fraction composed of aspartic and glutamic acids, alanine, serine, threonine, valine, leucine, isoleucine, methionine, cystine, proline and hydroxyproline; globulin fraction contained lysine, arginine, and protamine fraction contained aspartic and glutamic acids, serine, threonine, alanine and valine (*Anais Fac. Med. Univ. Relife Brazil* 1958, 18, 251; *Chem. Abstr.* 1960, 54, 4788 b).

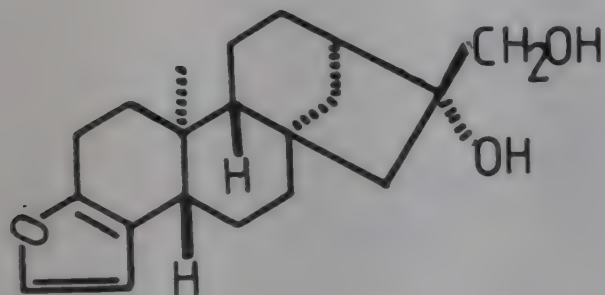
COFFEA (Rubiaceae)

C. arabica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 73).

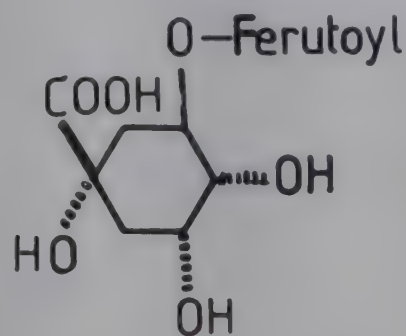
Absolute configuration of cafestol isolated from coffee bean oil (*J. Am. Chem. Soc.* 1962, 84, 7197; *Tetrahedron* 1964, 20, 1339; *ibid.* 1981, 37, 2371); isochlorogenic acid, neochlorogenic acid a mixture of chlorogenic acid and isomeric "Band 510" along with 3-feruloylquinic acid,

mp. 196°, from unroasted coffee (*Tetrahedron* 1962, 18, 1207); constitution of kahweol (*Chem. Ber.* 1963, 96, 2489; *ibid.* 1964, 97, 2652); a water-soluble arabinogalactan composed of arabinose and galactose (*J. Org. Chem.* 1965, 30, 4060).

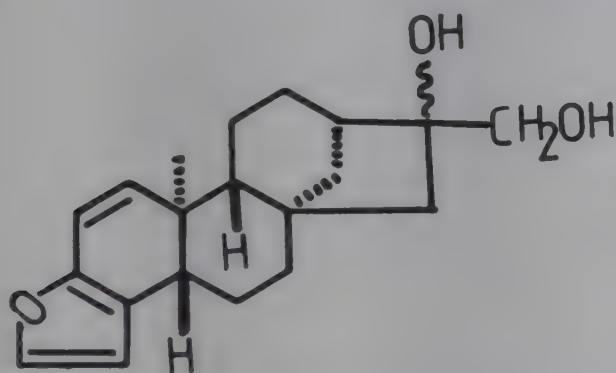
NEW COMPOUNDS



Cafestol



3-Feruloylquinic acid



Kahweol

COLA (Sterculiaceae)

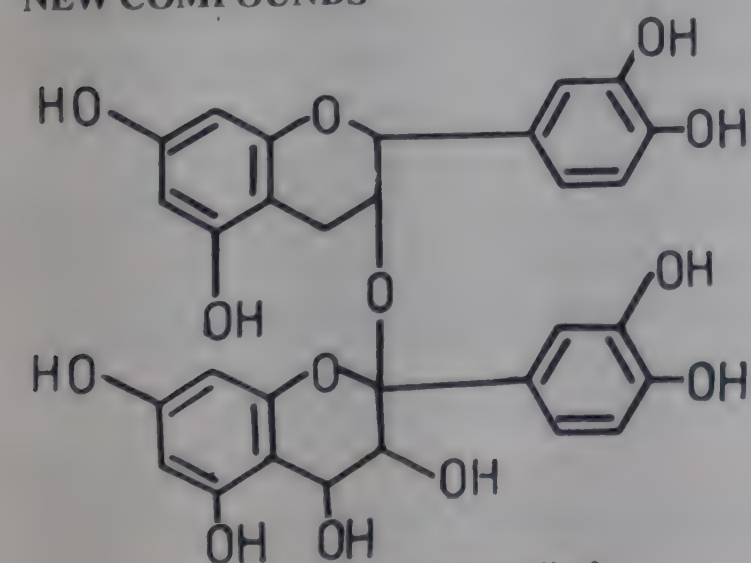
C. acuminata (Beauv.) Schott & Endl. syn. *Garcinia cola* Heckel

Eng. - Cola.

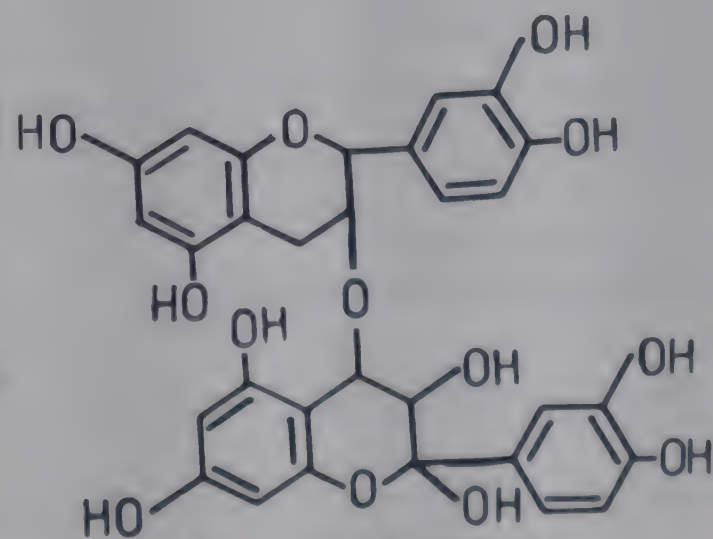
Condensed proanthocyanidins (I and II) from fruits (*Bull. Nat. Inst. Sci. India* No. 31, 1965, 24; *Chem. Abstr.* 1967, 66, 55333 d); cycloartenol and 24-methylenecycloartenol present in nuts (*J. Chem. Soc. C* 1967, 246).

Distribution : Introduced in India.

NEW COMPOUNDS



Cola proanthocyanidin I



Cola proanthocyanidin II

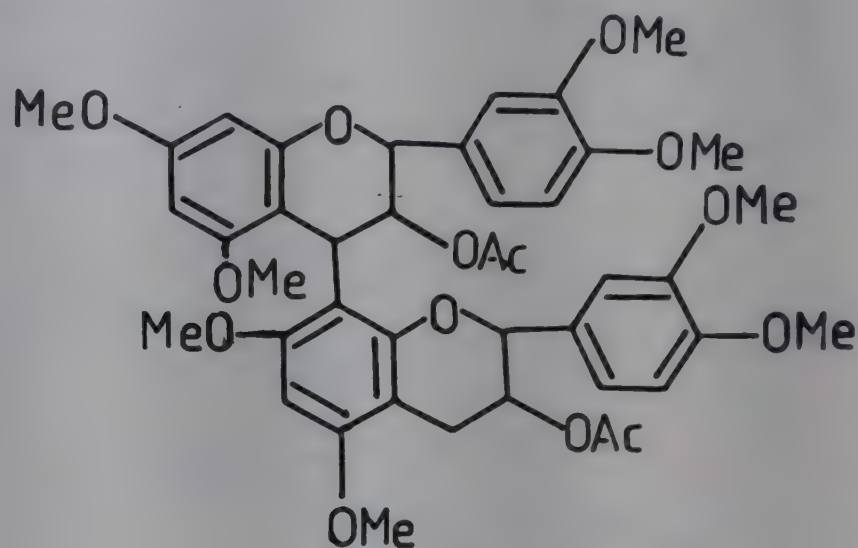
C. nitida (Vent.) Cheval.

Eng. - Cola.

Structure of a procyanidin isolated from nuts (*Chem. Commun.* 1967, 351).

Distribution : Introduced in India.

NEW COMPOUNDS



Cola Procyanidin

COLCHICUM (Liliaceae)

C. luteum Baker (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 73).

New alkaloids detected by PC (*Zh. Prikl. Khim.* 1965, 38, 322; *Chem. Abstr.* 1965, 62, 12160 d).

COLEUS (Lamiaceae)

C. blumei Benth.; see *C. scutellarioides* (L.) Benth.

C. scutellarioides (L.) Benth. syn. *C. flumei* Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 74).

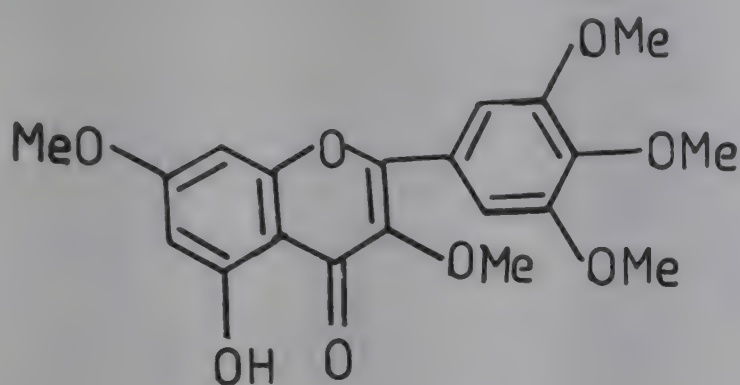
5,6,7-Trihydroxyflavone, 5,6,7,4'-tetrahydroxyflavone, cyanidin- 3,5-diglucoside, acylated cyanidin-3,5-diglucoside and pelargonidin-3-glucoside identified (*Ann. Fac. Sci. Agrar. Univ. Studi Napoli Portici* 1965, 30, 561; *Chem. Abstr.* 1966, 65, 4258 f).

COMBRETUM (Combretaceae)

C. quadrangulare Kurz.

Combretol shown to be myricetin-3,3',4',5',7-pentamethyl ether (*J. Chem. Soc.* (1966, 125).

NEW COMPOUNDS



Combretol

COMMIPHORA (Burseraceae)

C. mukul (Hook. ex Stocks) Engl.; see *C. wightii* (Arnott) Bhandari

C. wightii (Arnott) Bhandari syn. *C. mukul* (Hook. ex Stocks) Engl., *Balsamodendron mukul* Hook. ex Stocks (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 73).

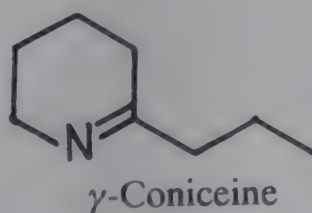
Myricyl alcohol, mp. 83° and β -sitosterol were isolated (*Pakistan J. Sci. Ind. Res.* 1967, 10, 21; *Chem. Abstr.* 1968, 68, 47009 d).

CONIUM (Apiaceae)

C. maculatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 75).

Structure of γ -coniceine revised to 2-propyl-3,4,5,6-tetrahydropyridine (*Rec. Trav. Chim.* 1961, 80, 513; *Chem. Abstr.* 1961, 55, 27384 c).

NEW COMPOUNDS

 γ -Coniceine

BIOLOGICAL ACTIVITY

Coniine, N-methylconiine and γ -coniceine were tested on isolated tissues, anaesthetised cats and hens, conscious mice and young chicks; their most pronounced action was to block spinal reflexes. Large doses stimulated skeletal muscles and subsequently caused neuromuscular block (*J. Pharm. Pharmacol.* 1963, 15, 1).

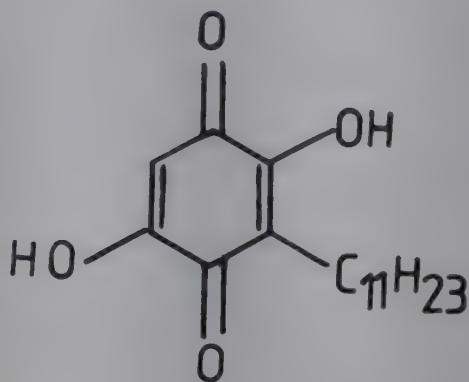
CONNARUS (Connaraceae)

C. monocarpus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 75).

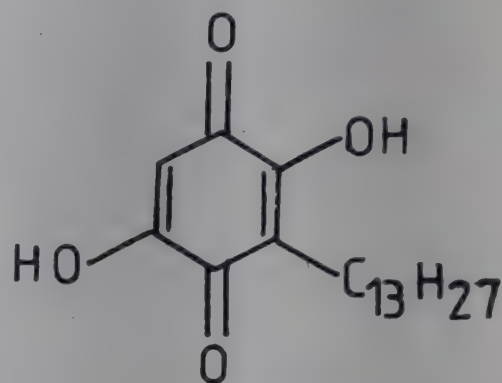
Rapanone, embelin, bergenin and leucopelargonidin from roots (*Bull. Nat. Inst. Sci. India*

No. 31, 1965, 8; *Chem. Abstr.* 1967, 66, 55181 c; *Phytochemistry* 1964, 3, 335).

NEW COMPOUNDS



Embelin



Rapanone

CONSOLIDA (Ranunculaceae)

C. ambigua (L.) Ball. & Heywood syn. *Delphinium ajacis* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 92).

Ajaconine, mp. 167°, from seeds (*Tetrahedron* 1961, 14, 54); a delphinidin diglycoside isolated (*J. Sci. Ind. Res.* 1962, 21B, 591).

C. regalis S.F. Gray syn. *Delphinium consolida* L.

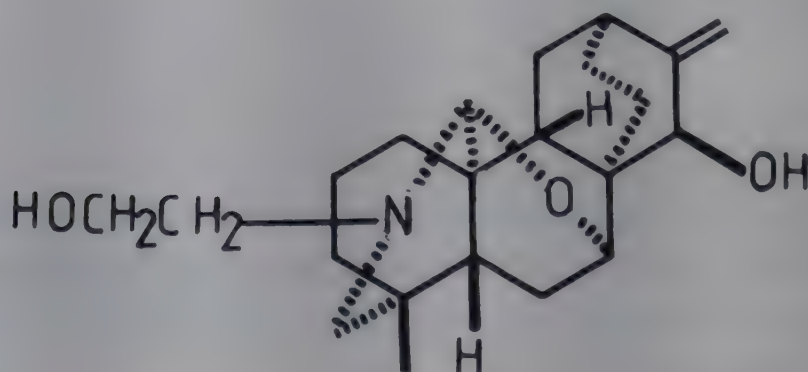
Eng. - Larkspur.

Insecticidal activity due to alkaloid content (*Epidemiol. Mikrobiol. Infektsiozni Bolesti* 1964, 1, 23; *Chem. Abstr.* 1965, 62, 16628 b).

Ajaconine from seeds found to be a 9,17-carbinolamine ether (*Tetrahedron* 1961, 14, 54); delsolin, delcosine and lycoctonine identified in flowers by TLC (*Diss. Pharm. Pharmacol.* 1968, 20, 635; *Chem. Abstr.* 1969, 70, 84937 s).

Distribution : Grown in gardens as an ornamental.

NEW COMPOUNDS



Ajaconine

CONVALLARIA (Liliaceae)

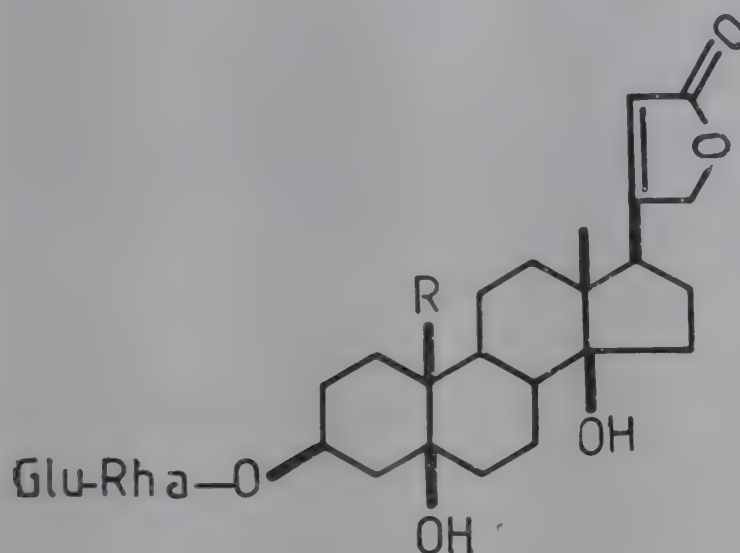
C. majalis L.

Eng. - Lily of the valley.

Deglucocheirotxin, convallatoxin, convallatoxol, convalloside and a new glycoside J, mp. 234° , identified as strophanthidol-O- α -L-rhamnosyl-D-glucoside, from seeds (*Dokl. Akad. Nauk SSR* 1962, 147, 625; *Chem. Abstr.* 1963, 58, 10294 c); convallatoxin, glucoconvalloside, convallatoxol, convallatoxolide, convallatoxol from different parts (*Planta Med.* 1962, 10, 459; *Acta Pol. Pharm.* 1963, 20, 329; *Chem. Abstr.* 1964, 61, 15931 d).

Distribution : Grown in gardens as ornamental.

NEW COMPOUNDS



Convallatoxololide

R = Me

Glycoside J

R = CH₂OH

CONVOLVULUS (Convolvulaceae)

C. arvensis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 76).

β -Methylesculetin detected in all parts of plant (*Rev. Med.* 1967, 13, 354; *Chem. Abstr.* 1968, 68, 10255 f).

CORCHORUS (Tiliaceae)

C. acutangulus Lam.; see *C. aestuans* L.

C. aestuans L. syn. *C. acutangulus* Lam. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 76).

Glucoside A, mp. 155° , glucoside B, mp. 152° and glucoside C, mp. 164° , from seeds (*Indian J. Pharm.* 1968, 30, 214).

C. capsularis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 76).

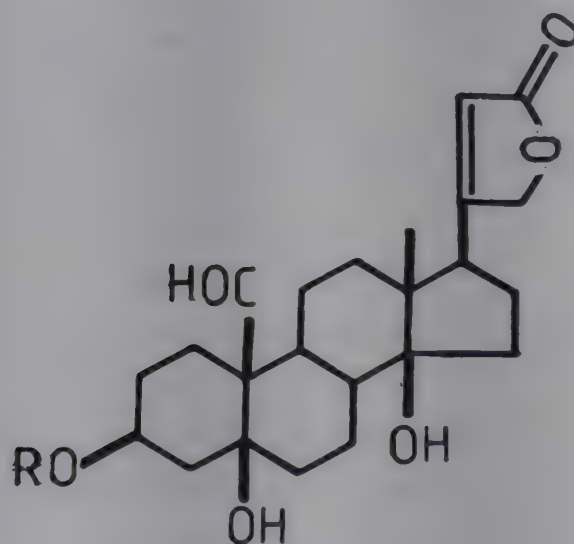
Determination of cardiac glycosides in seeds by colorimetry; glycoside mixture contained olitoriside and corchoroside (*Uzbeksk. Khim. Zh.* 1965, 9, 18; *Chem. Abstr.* 1965, 63, 3315 g);

veticoside, mp. 168° , from seeds (*Tetrahedron Lett.* 1969, 789).

C. olitorius L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 77).

Structure of olitoriside from seeds elucidated as strophanthidin- 3- β -D-boivinosido- β -D-glucoside (*Zh. Obshch. Chim.* 1959, 29, 1235; *Chem. Abstr.* 1960, 54, 8893 g); a new cardiac glycoside - corchoroside A - from seeds (*Farmakol. Toksikol.* 1961, 24, 197; *Chem. Abstr.* 1961, 55, 26262 b); seeds contained aglycones - strophanthidin and corchorogenin; glycosides - corchsularin, olitoriside and corchorosides A and B; corchoralic acid, β -sitosterol and a saponin (*Egypt. Pharm. Bull.* 1960, 42, 555; *Chem. Abstr.* 1963, 58, 1301 b); glycosides determined colorimetrically and main components of glycoside mixture - olitoriside and corchoroside A - separated by TLC (*Uzbeksk. Khim. Zh.* 1965, 9, 18; *Chem. Abstr.* 1965, 63, 3315 g); veticoside, mp. 168° , from seeds (*Tetrahedron Lett.* 1969, 789).

NEW COMPOUNDS



Corchoroside A

R = D-Boivinose

Olitoriside

R = D-Boivinose-Glu.

CORDIA (Boraginaceae)

C. myxa Roxb. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 77).

β -Sitosterol, palmitic, stearic, oleic and linolenic acids isolated from seed oil (*Planta Med.* 1967, 15, 240).

Note : The Glossary treats *Cordia myxa* Roxb. (non L.), *C. obliqua* Willd. and *C. latifolia* Roxb. as synonyms of *C. dichotoma* Forst., but according to Kazmi (*J. Arnold. Arb.* 51: 140, 1970) *C. myxa* and *C. obliqua* (syn. *C. latifolia*) are two distinct species.

CORIANDRUM (Apiaceae)

C. sativum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956,

p. 77).

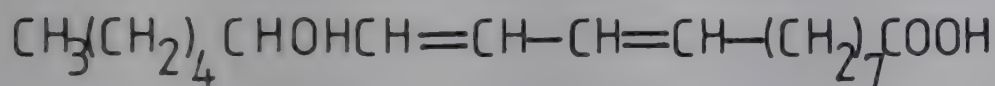
β -Sitosterol, D-mannitol and flavonoid glycosides from defatted seeds (*Arch. Pharm.* 1961, 294, 138; *Chem. Abstr.* 1961, 55, 12550 i).

CORIARIA (Coriariaceae)

C. nepalensis Wall. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 78).

Principal fatty acid from seed oil characterised as (R) 13-hydroxy-cis-9,trans-11-octadecadienoic acid (I) (*Tetrahedron Lett.* 1966, 4329).

NEW COMPOUNDS



I

CORNUS (Cornaceae)

C. sanguinea L.; see *Swida sanguinea* (L.) Oplz

CORYDALIS (Fumariaceae)

C. gortschakovii Schrenk.

Protopine and a new base, mp. 183°, from aerial parts of plant (*Dokl. Akad. Nauk SSR* 1965, 162, 607; *Chem. Abstr.* 1965, 63, 5695 b).

Distribution : Kashmir Himalayas, alpine region.

C. govaniana Wall. var. *govaniensis* (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 78).

Choline as reineckate, corlumine, mp. 162°, bicuculline, mp. 199°, and isocorydine, mp. 186°, from root (*Can. J. Chem.* 1961, 39, 1801).

C. longipes DC. syn. *C. sibirica* auct. (non L.) Pers.

A new alkaloid - sibiricin - isolated (*Can. J. Chem.* 1969, 47, 3585).

Distribution : Throughout Himalayas, above 2500 m.

C. ophiocarpa Hook. & Thoms.

Composition of tertiary and quaternary bases studied by chromatography; protopine, coptisine and berberine detected (*Diss. Pharm. Pharmacol.* 1968, 20, 557; *Chem. Abstr.* 1969, 70, 17544 y).

Distribution : Sikkim Himalayas, alt. 2700 m.

C. sibirica (L.) Pers.; see *C. longipes* DC.

C. stewartii Fedde -

Kash. - Mamiri.

Structure of alkaloid corydinine (*Pakistan J. Sci. Ind. Res.* 1968, 11, 337; *Chem. Abstr.* 1969, 70, 97012 m).

Distribution : Kashmir Himalayas, above 3000 m.

C. stricta Steph. ex Fisch.

Base 2, mp. 127°, identified as α - β -hydrastine (*Dokl. Akad. Nauk Tadzh. SSR* 1967, 10, 30; *Chem. Abstr.* 1968, 68, 877 v).

Distribution : Kashmir Himalayas alpine region.

CORYLUS (Corylaceae)

C. avellana L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 78).

Chromatographic and biological analysis of growth regulating substances in pollen extract; biological tests on oat coleoptiles; chromatogram of chloroform extract showed presence of inhibitors and a new strongly growth-stimulating substance different from indole-acetic acid; chromatogram of acidic ether extract showed presence of activator, inhibitor and a substance with strong auxin activity (*Acta Soc. Bot. Pol.* 1958, 27, 75; *Chem. Abstr.* 1960, 54, 689 h).

Taraxerol and stigmast-5-en-3 α ,7 α ,22 α -triol and β -sitosterol from leaves (*Z. Naturforsch.* 1966, 21, 78; *Chem. Abstr.* 1966, 64, 18033 h)

COSMOS (Asteraceae)

C. bipinnatus Cav.

Eng. - Cosmos.

β -Sitosterol- β -D-glucoside from seeds (*Indian J. Appl. Chem.* 1963, 26, 174); nelumboside (0.01%) from leaves, identified as quercetin-3-glucoglucuronide (*Yakugaku Zasshi* 1961, 81, 1158; *Chem. Abstr.* 1962, 56, 1527 d).

Distribution : Grown in gardens as ornamental.

COTINUS (Anacardiaceae)

C. coggygia Scop. syn. *Rhus cotinus* L.

H. - Batra; P. - Tung; Kumaon - Jaltunga; Kash. - Chariant.

(-)Fustin isolated from plant (*Biochem. J.* 1960, 77, 315).

Distribution : Himalayas from Kashmir to Nepal, alt. 900-1500 m.

COUROUPITA (Lecythidaceae)

C. guianensis Aubl.

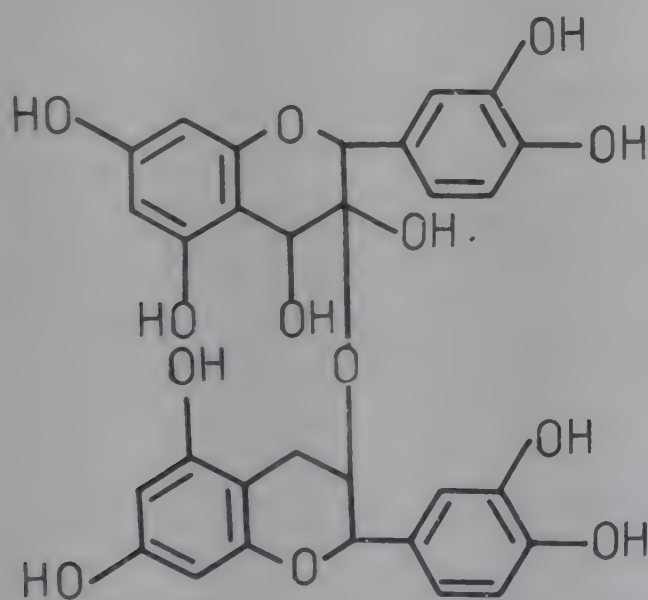
α -Amyrin, β -amyrin, β -sitosterol, an unknown alcohol, mp. 101°, and an unidentified triterpene alcohol, mp. 203°, from bark (*Curr. Sci.* 1966, 35, 146).

Distribution : Grown in gardens as ornamental.

CRATAEGUS (Rosaceae)

C. oxyacantha L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 79).

(-)Epicatechin and a dimeric procyanidin composed of cyanidin and epicatechin, isolated from fruits (*Chem. Ber.* 1961, 94, 3032); leucocyanidin, mp. 232°, isolated from fruits and leaves and its structure proposed (*Rocz. Chem.* 1965, 38, 1773; *Chem. Abstr.* 1965, 62, 14615 d; *Rocz. Chem.* 1965, 39, 1839; *Chem. Abstr.* 1966, 64, 18032 h); a polyphenolic compound, mp. 180-200° and new protistocidine from flowers (*Acta Physiol. Pol.* 1958, 9, 39; *Chem. Abstr.* 1960, 54, 2584 h; *Bratislav. Lekarske Listy* 1961, 41, 129; *Chem. Abstr.* 1962, 56, 3563 h).

NEW COMPOUNDS

Leucocyanidin

BIOLOGICAL ACTIVITY

Protistocidine was toxic to *Tetrahymena pyriformis* and *Trichomonas vaginalis* (*Bratislav. Lekarske Listy* 1961, 41, 129; *Chem. Abstr.* 1962, 56, 3563 h). The polyphenolic compound had LD50 of 0.5 mg/kg in mice; it showed positive inotropic and negative chronotropic actions and abolished effect of acetylcholine on isolated frog heart. It acted as sedative in caffeine-excited mice (*Acta Physiol. Pol.* 1958, 9, 39; *Chem. Abstr.* 1960, 54, 2584 h).

Flavan polymer fraction, isolated from leaves, showed hypotensive activity in cats and strong and prolonged cardiogenic action in rabbit. The i.p. and s.c. LD50 values in mice were 130 and 300 mg/kg respectively (*Arzneim.-Forsch.* 1967, 17, 490); corulin (a mixture of corglycone, khellin and rutin) as well as extract of hawthorn had positive inotropic and negative chronotropic effects on isolated rabbit heart (*Farmacol. Toksikol.* 1961, 24, 163; *Chem. Abstr.* 1961, 55, 26261 e); a preparation obtained by acid treatment of aqueous extract of leaves, fruits and flowers used against high blood pressure (*Ger.* 1,076,326 (1960) Feb. 25; *Chem. Abstr.* 1962, 56, 15617 a).

A black-red dye lake (probably a phlobaphene) prepared by acid treatment of extract of fruits, flowers and leaves, caused marked and protracted coronary dilation in Langendorff

heart preparation of guinea pig; in dogs it increased coronary perfusion in situ with slight increase of blood pressure; synergised the coronary dilation action of theophylline, hydroethyltheophylline, caffeine, papaverine, sodium nitrite, adenosine and adrenaline. (-)Epicatechin was mainly responsible for pharmacological action of the extract preparation (*Arzneim.-Forsch.* 1960, 10, 60,825).

Note : Status of Indian plant described in FBI as *Crataegus oxycantha* L. is *C. songarica* C. Koch. [syn. *C. oxycantha* auct. (non L.)]. Since the above work was done in Europe, the authors must have used Linn. sp.

CRATEVA (CRATAEVA) (Capparaceae)

C. religiosa Forst.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 79).

Lupeol isolated from bark (*Bull. Calcutta Sch. Trop. Med.* 1959, 7, 105; *Chem. Abstr.* 1960, 54, 11384 d).

Note : In the Glossary *C. religiosa* Hook.f. & Thoms. non Forst. f. has been wrongly treated as synonymous with *C. nurvala* Buch.- Ham. According to our present knowledge *C. religiosa* Forst.f. does occur in the eastern part of India (Bennet 1987, *Name Changes in Flowering Plants of India and Adjacent Regions*, Triseas Publishers, Dehra Dun).

CRESSA (Convolvulaceae)

C. cretica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1965, p. 80).

Chemical analysis of minerals present in aqueous extractive of shrub and analysis of ash (*Curr. Sci.* 1965, 34, 247).

CRINUM (Amaryllidaceae)

C. defixum Ker.-Gawl. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 80).

Lycorine, mp. 274°, isolated from bulbs and seeds (*Colloq. Int. Cent. Nat. Rech. Sci.* 1966, 144, 89; *Chem. Abstr.* 1967, 67, 79632 x).

C. pratense Herb.

Lycorine isolated from roots (*Indian J. Pharm.* 1961, 23, 274).

Distribution : Grown as ornamental in gardens.

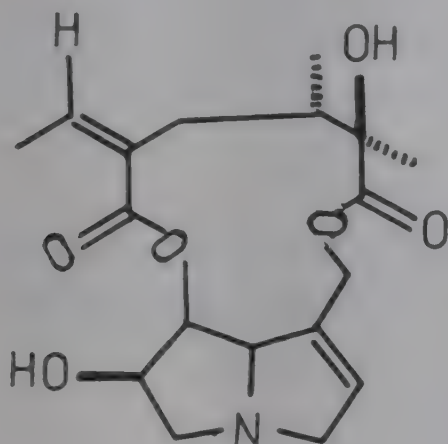
CROTALARIA (Papilionaceae)

C. anagyroides H.B. & K.

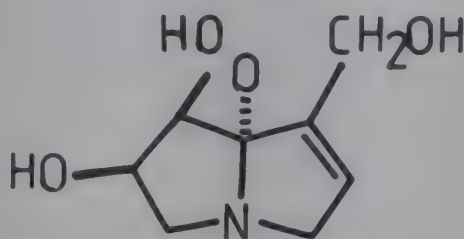
1-Methylenepyrrolizidine and senecionine, mp. 232°, from seeds (*Planta. Med.* 1964, 12, 173); isolation of anacrotine, mp. 191° and new pyrrolizidine aminoalcohol - crotaneine (*Tetrahedron Lett.* 1966, 537).

Distribution : A native of sub-tropical south America, introduced into India as a temporary shade or green manure plant in tea, coffee and coconut plantations; now naturalised in the Nilgiris.

NEW COMPOUNDS



Anacrotine



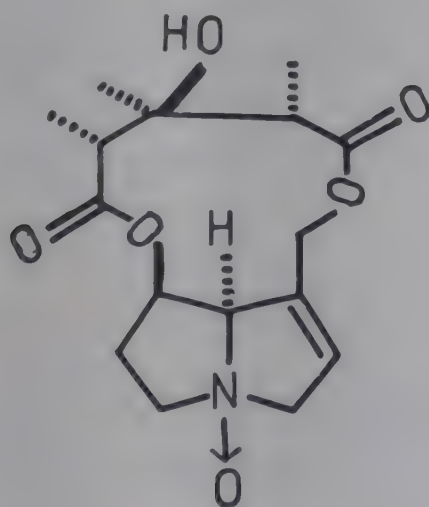
Crotanecine

C. berteriana DC. syn. *C. fulva* Roxb.

Isolation of fulvine N-oxide (*Aust. J. Chem.* 1963, 16, 233); crystal structure of fulvine N-oxide (*Acta Crystallog. Sec. B* 1973, 29, 2918).

Distribution : Mysore and the Nilgiris.

NEW COMPOUNDS



Fulvine N-oxide

C. fulva Roxb.; see *C. berteriana* DC.

C. grahamiana W. & A.

Monocrotaline, retronecine, mp. 160°, grahamine isolated from seeds (*Curr. Sci.* 1966, 35, 514; *Aust. J. Chem.* 1969, 22, 1773).

Distribution : Tamil Nadu, ascending to 1200 m. in hills.

C. incana L.

Anacrotine isolated and four other alkaloids detected by TLC; alkaline hydrolysis of crude alkaloid mixture yielded crotanecine (*J. Chem. Soc. C* 1968, 235).

Distribution : Kumaon in Uttar Pradesh, 1500 m.

C. laburnifolia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 81).

An alkaloid - crotalaburnine, mp. 185° , a pigment - lutexin and β -sitosterol isolated from seeds (*Indian J. Pharm.* 1966, 28, 277; *Planta Med.* 1968, 16, 432); a pyrrolizidine alkaloid - anacrotine, mp. 197° - isolated from seeds, shown to be a cyclic diester of senecic acid (*Curr. Sci.* 1967, 36, 363; *Indian J. Chem.* 1967, 5, 655).

BIOLOGICAL ACTIVITY

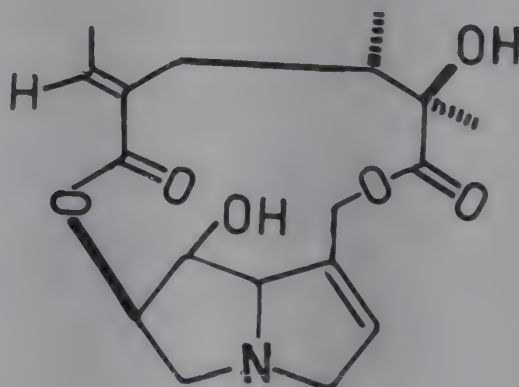
Crotalaburnine showed inhibitory action on contraction of guinea pig ileum induced by acetylcholine, histamine, 5-hydroxytryptamine, nicotine and barium (*Indian J. Pharm.* 1964, 26, 322).

C. madurensis W. & A.

Madurensine, mp. 175° , isolated (*Tetrahedron Lett.* 1966, 537) and its structure elucidated (*Chem. Commun.* 1970, 65; *Ann. Quim.* 1972, 68, 883).

Distribution : Mysore and Tamil Nadu, including Nilgiris.

NEW COMPOUNDS



Madurensine

C. medicaginea Lam.

A base N-oxide isolated from plant (*Curr. Sci.* 1966, 35, 460).

Distribution : Throughout plains of India, ascending to 1800 m. in Kashmir.

C. mucronata Desv.; see *C. pallida* Dryand.

C. mysorensis Roth.

β -Sitosterol, scopoletin and monocrotaline isolated from seeds (*J. Indian Chem. Soc.* 1968, 45, 1052).

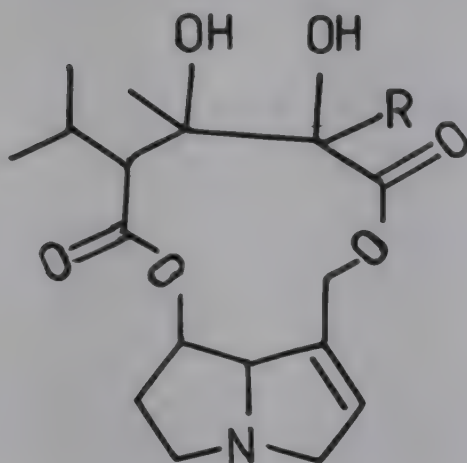
Distribution : Throughout plains of India, ascending to 1200 m. in hills.

C. ovalifolia Wall. ex Fyson syn. *C. rubiginosa* auct. (non Willd.)

Two major alkaloids - trichodesmine, mp. 154° and junceine, mp. 188° - from seeds (*Aust. J. Chem.* 1966, 19, 2189).

Distribution : Tamil Nadu, ascending to 1200 m. in hills.

NEW COMPOUNDS



Junceine

R = CH₂OH

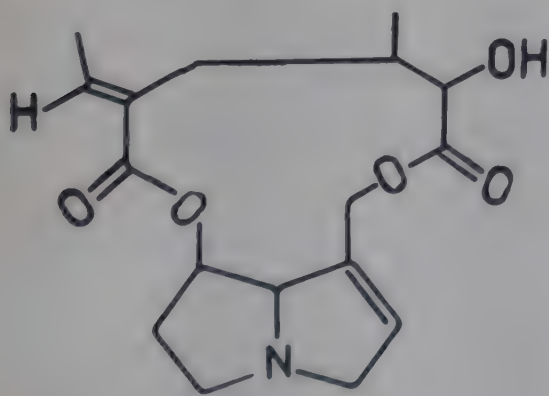
Trichodesmine

R = Me

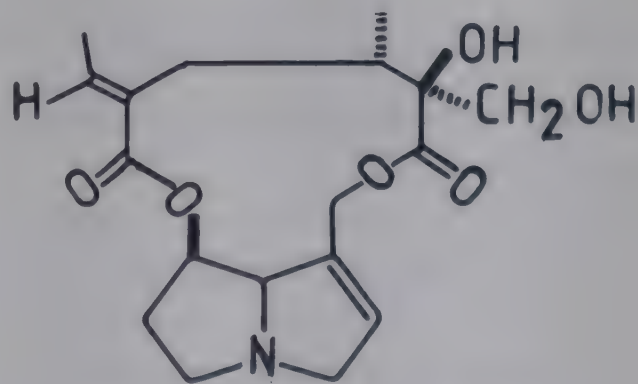
C. pallida Dryand. syn. *C. mucronata* Desv., *C. striata* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 81).

A new alkaloid - mucronatine, mp. 179° - isolated from seeds (*Yao Hsueh Hsueh Pao* 1964, 11, 246; *Chem. Abstr.* 1964, 61, 8129 c); isolation of alkaloid - usaramine, mp. 178° (*Indian J. Chem.* 1967, 5, 655); alkaloid - crotastratine, mp. 133° - from seeds (*Curr. Sci.* 1968, 37, 285); luteolin, vitexin and its O-xyloside isolated from seeds (*Curr. Sci.* 1969, 38, 65); isolation of new alkaloid - mucronatinine - and mucronatine shown to be its stereoisomer (*Tetrahedron* 1968, 24, 6319); new alkaloid - nilgirine, mp. 127° - isolated from seeds (*Tetrahedron Lett.* 1968, 5605).

NEW COMPOUNDS



Nilgirine



Mucronatinine

C. paniculata Willd.

The major alkaloid - fulvine - from seeds exhibited papaverine- like activity on rat and guinea pig ileum (*Indian J. Pharm.* 1968, 30, 153).

Distribution : Peninsular India, in plains.

C. retusa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956,

p. 81).

Quercetin, quercetin-3-O-glucoside, mp. 228° , and isoquercitrin from seeds (*Curr. Sci.* 1969, 38, 65).

C. rubiginosa Willd.; see *C. ovalifolia* Wall. ex Fyson

C. semperflorens Vent.

A new otonecine ester - crosemperine, mp. 117° - isolated from defatted seeds (*Aust. J. Chem.* 1967, 20, 805).

Distribution : Peninsular India.

C. sericea Retz. syn. *C. spectabilis* Roth (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 81).

α -Carotene, triacontane, 22,23-dihydrostigmasterol and a new alkaloid - sericine, mp. 180° - along with monocrotaline isolated from seeds (*J. Pharm. Pharmacol.* 1961, 13, 365).

BIOLOGICAL ACTIVITY

Monocrotaline has prolonged and pronounced hypotensive effect on blood pressure in dog and depressant effect on isolated rabbit heart. It does not cause or affect acetylcholine-induced contraction of rectus abdominis muscle. It exerts a powerful stimulant effect on smooth musculature, especially of ileum and uterus. It is not toxic to rats and pigeons in pharmacologically-effective doses. The compound exhibits activities which are characteristic of a parasympathomimetic drug. Absence of potentiation of responses of acetylcholine on blood pressure and smooth muscle shows that it does not act like an anticholinesterase drug and that it acts directly on effector cells. It possesses muscarinic but not the nicotinic actions of acetylcholine as evidenced by absence of any effect on autonomic ganglia, skeletal muscle etc. (*Indian J. Med. Res.* 1962, 50, 435).

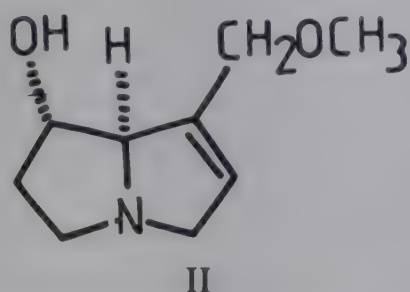
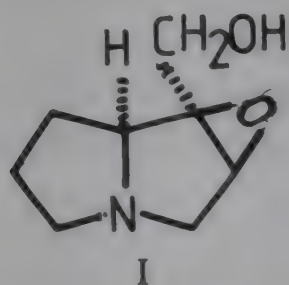
C. spectabilis Roth; see *C. sericea* Retz.

C. striata DC.; see *S. pallida* Dryand

C. trifoliatum Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 81).

Major alkaloids isolated were 1-methoxymethyl-1,2-dehydro-8 α -pyrrolizidine (methyl ether of supinidine) and 7 β -hydroxy-1-methoxymethyl-1,2-dehydro-8 α -pyrrolizidine (methyl ether of retronecine) (*Aust. J. Chem.* 1962, 15, 121); 1-methoxymethyl-1,2-epoxypyrrolizidine and its 7 β -hydroxy derivative isolated (*Aust. J. Chem.* 1963, 16, 131); two new alkaloids - 1 β ,2 β -epoxy-1 α -hydroxymethyl-8 α -pyrrolizidine (I) and 7- α -hydroxy-1-methoxymethyl-1,2-dehydro-8 α -pyrrolizidine (II) - isolated and characterised (*Aust. J. Chem.* 1967, 20, 757).

NEW COMPOUNDS



C. verrucosa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 81).

An alkaloid - crotalaburnine, mp. 194° - flavonoids - isovitexin, mp. 230° , vitexin-4'-xyloside, vitexin-O-glycoside and apigenin-O-glycoside - along with β -sitosterol from seeds (*Indian J. Pharm.* 1967, 29, 311).

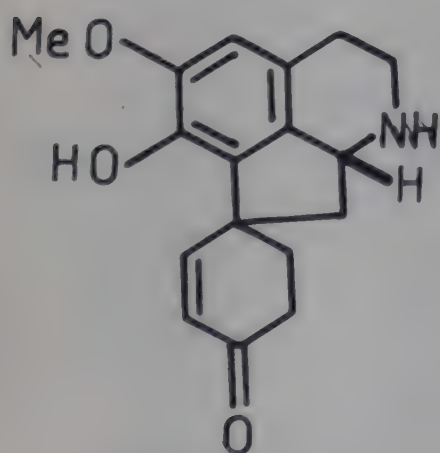
CROTON (Euphorbiaceae)

C. bonplandianum Baill. syn. *C. sparsiflorus* Morong.

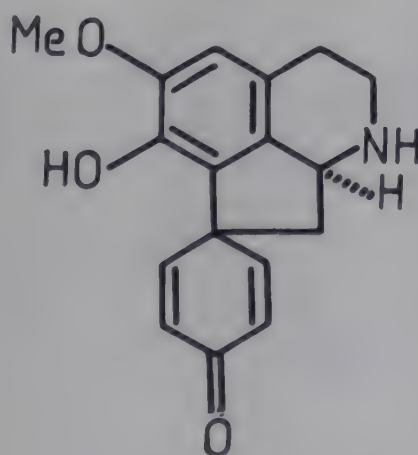
A new alkaloid - sparsiflorine - isolated from leaves (*Sci. Cult.* 1959, 24, 572); isolation of a reddish-brown compound, mp. 133° (*J. Indian Chem. Soc.* 1962, 39, 545); isolation and partial structure of compound B (*Chem. Ber.* 1962, 95, 2623); structure of sparsiflorine (*Tetrahedron Lett.* 1965, 1539); crotsparine, a new proaporphine alkaloid, isolated (*Experientia* 1968, 24, 10); a phenolic isoquinolinedienone alkaloid - crotoflorine - isolated (*J. Indian Chem. Soc.* 1968, 95, 1087); a new base - crotsparinine, mp. 184° - isolated (*Experientia* 1969, 25, 354).

Distribution : Throughout plains of India.

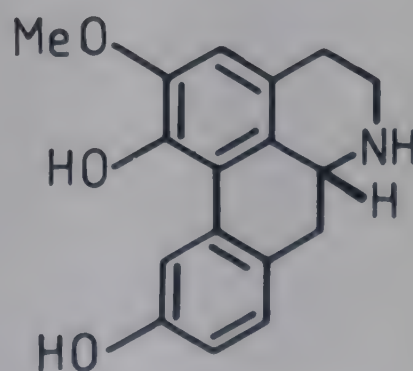
NEW COMPOUNDS



Crotsparinine



Crotoflorine



Sparsiflorine

C. caudatus Geisel (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 82).

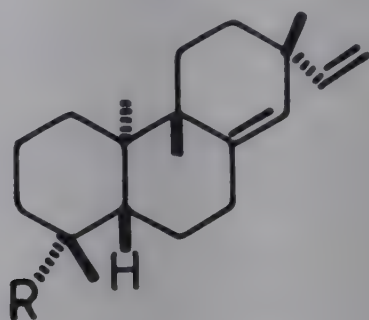
Dotriacontanol, β -amyrin and β -sitosterol from stem bark (*J. Indian Chem. Soc.* 1969, 46, 323).

C. oblongifolius Roxb.; see *C. roxburghii* Balak.

C. roxburghii Balak. syn. *C. oblongifolius* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 82).

β -Sitosterol, a diterpene alcohol, mp. 143° and a new diterpene - oblongifoliol - from seeds, roots and bark (*Tetrahedron Lett.* 1968, 4685); isolation of deoxyoblongifoliol and elucidation of structure as 3α -hydroxydarut-8(14),15-diene [3α -hydroxy(-)pimara-8(14),15-diene] (*Indian J. Chem.* 1969, 7, 838).

NEW COMPOUNDS



Oblongifoliol

R = Me

Deoxyoblongifoliol

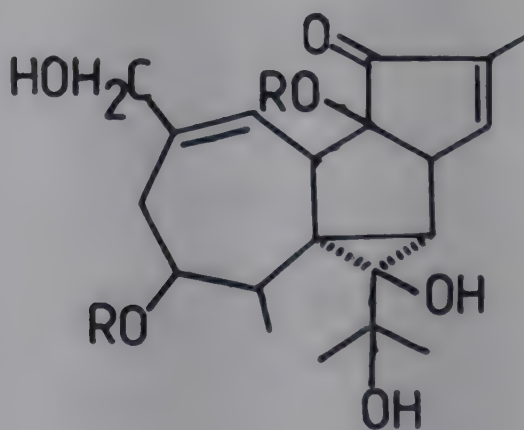
R = CH₂OH

C. sparsiflorus Morong.; see *C. bonplandianum* Baill.

C. tiglium L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 82).

Isolation, structure and semisynthesis of new highly active tumor-enhancing compound C-3 from seeds (*J. Med. Chem.* 1965, 8, 672; *Chem. Abstr.* 1965, 63, 11386 e).

NEW COMPOUNDS



Compound C-3

R = COMe/CO(CH₂)₁₂Me

CRYPTOMERIA (Taxodiaceae)

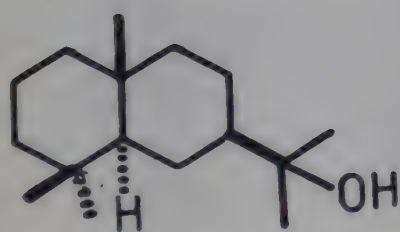
C. japonica (L.f.)D. Don

A new diterpene - phyllocladanol, mp. 182° - along with sandaracopimarinel, mp. 63° and β -sitosterol from wood (*Bull. Agric. Chem. Soc. Jpn.* 1960, 24, 65; *Chem. Abstr.* 1960, 54, 12185

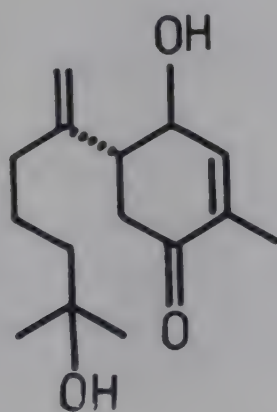
e; *Bull. Chem. Soc. Jpn.* 1964, 37, 886); isodextropimaric acid, mp. 163° , sugiol, mp. 294° , xanthopterol, mp. 256° and behenic acid isolated from bark (*Nippon Nogi Kagaku Kaishi* 1961, 35, 724; *Chem. Abstr.* 1964, 60, 4460 f); cryptomeridiol from heartwood (*Nippon Mukuzai Gakkaishi* 1964, 10, 81; *Chem. Abstr.* 1964, 61, 9532 h); β -eudesmol, pilgerol, cryptomerion, δ -cadinene, calamenene, calacorene and copaene from wood oil (*Bull. Chem. Soc. Jpn.* 1964, 37, 1029); hinokiflavone, cryptomerin A, mp. 308° and cryptomerin B, mp. 302° , isolated (*Yakugaku Zasshi* 1960, 80, 1647; *Chem. Abstr.* 1961, 55, 10424 f; *Chem. Pharm. Bull.* 1966, 14, 1404; *Tetrahedron Lett.* 1967, 5223; (-)-kaurene and (+)-phyllocladene isolated (*Phytochemistry* 1968, 7, 135); structures of sugiresinol, hydroxysugiresinol and cryptomerone elucidated (*Tetrahedron Lett.* 1967, 763; *Mokuzai Gakkaishi* 1968, 14, 425; *Chem. Abstr.* 1969, 70, 114956 s; *Mokuzai Gakkaishi* 1968, 14, 430; *Chem. Abstr.* 1969, 70, 114957 t; *Tetrahedron Lett.* 1969, 3185).

Distribution : Native of Japan, introduced in hill stations of India.

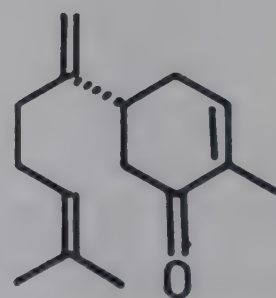
NEW COMPOUNDS



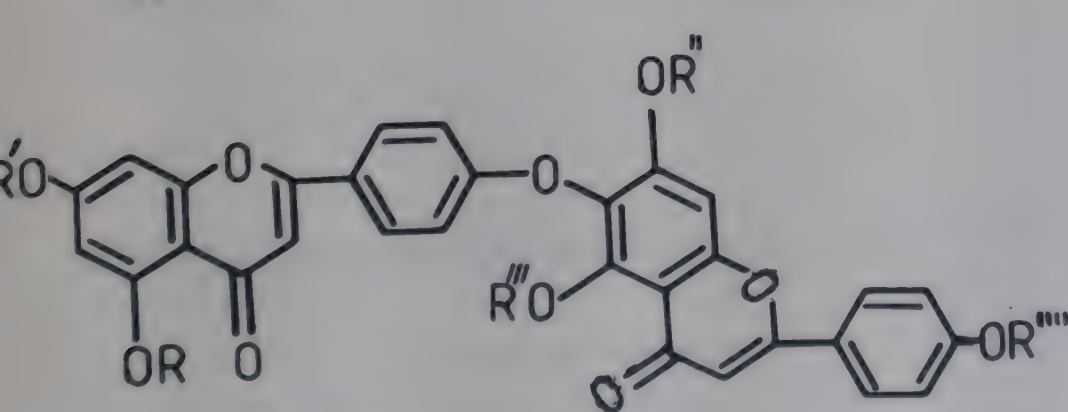
Cryptomeridiol



Cryptomerone



Cryptomerion



Cryptomerin

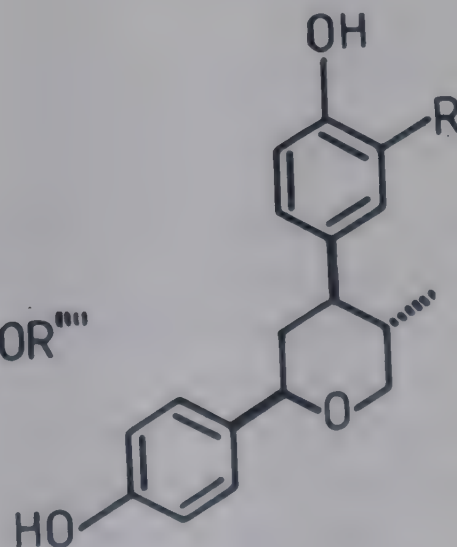
$R, R', R'', R''' = H, R'''' = Me$

Cryptomerin B

$R, R', R'' = H, R''', R'''' = Me$

Hinokiflavone

$R, R', R'', R''', R'''' = H$

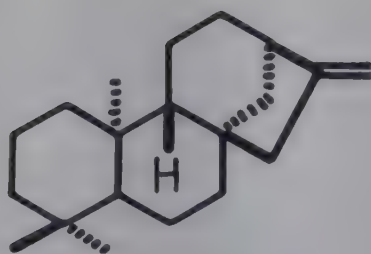


Sugiresinol

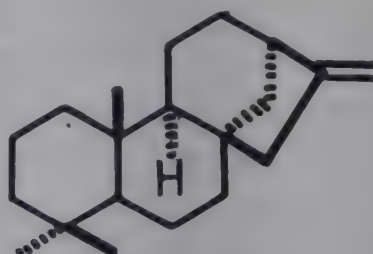
$R = H$

Hydroxysugiresinol

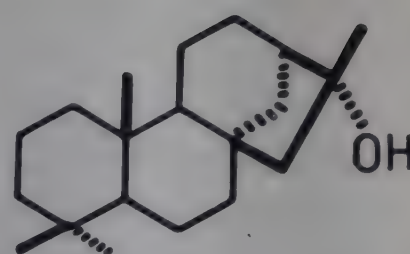
$R = OH$



(-)-Kaurene



(+)Phyllacladene



Phyllocladanol

CRYPTOSTEGIA (Asclepiadaceae)

C. grandiflora (Roxb.) R.Br. ex Lindl. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 82).

Plant extract showed significant hypoglycaemic activity in normal rabbits due to hepatotoxic action, but failed to reduce blood sugar of alloxan-diabetic rabbits (*Indian J. Med. Res.* 1967, 55, 1277).

CUCUBALUS (Caryophyllaceae)

C. baccifer L. (bacciferus) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 83).

Saccharides from roots having general structure $[\alpha\text{-D-galactopyranosyl-(1}\rightarrow\text{6)}^n\text{-}\alpha\text{-D-glucopyranosyl(1}\rightarrow\text{2)-}\beta\text{-D-fructofuranosyl(x}\rightarrow\text{1)} - [\alpha\text{-D-galactopyranosyl(1}\rightarrow\text{6)}]^{n'}\text{-}\alpha\text{-D-galactopyranoside}$, $n = 0,1$; $n' = 0,1-4$; $x = 1,3$ together with sucrose, raffinose and stachyose (*Bull. Soc. Chim. Biol.* 1960, 42, 737; *Chem. Abstr.* 1961, 55, 11559 h).

CUCUMIS (Cucurbitaceae)

C. prophetarum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 83).

Cucurbitacin C monohydrate, mp. 205° , from fruits (*Curr. Sci.* 1968, 37, 361).

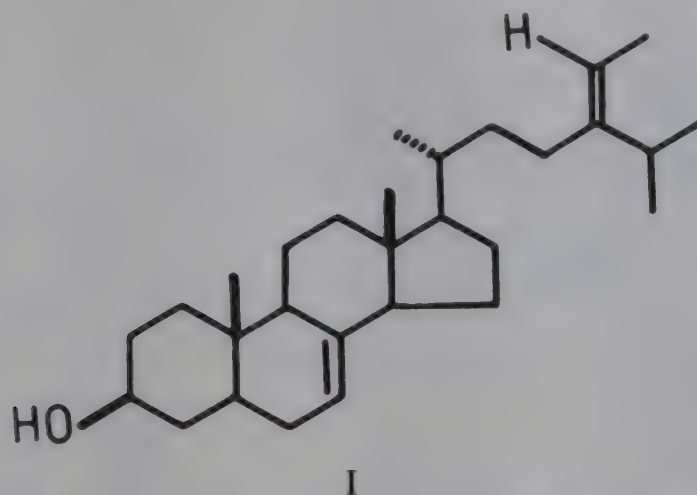
CUCURBITA (Cucurbitaceae)

C. maxima Duch. ex Lam. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 83).

Aqueous and alcoholic extracts of seeds possessed anthelmintic properties. Aqueous extract caused marked reduction in contraction amplitude and rate of frog heart which was not blocked by atropine (*Labdev* 1967, 5, 64; *Chem. Abstr.* 1967, 66, 114420 e).

Stigmasta-7,24(28)-dien- 3β -ol (I) and stigmasta-7,25-dienol acetate isolated from seeds (*Tetrahedron Lett.* 1968, 20, 2443); euglobulins from seed was a mixture of three proteins (*C.R. Soc. Biol.* 1968, 162, 1128; *Chem. Abstr.* 1969, 70, 112342 a).

NEW COMPOUNDS



C. pepo L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 83).

Seeds showed anthelmintic activity *in vitro* and *in vivo* against *Hymenolepis nana* and *Dicrocoelium dendriticum* (*Bull. Soc. Pharm. Bord.* 1966, 105, 189; *Chem. Abstr.* 1967, 67, 29843 w).

CUPRESSUS (Cupressaceae)

C. comeyana Hort. ex Carriere syn. *C. funebris* auct. (non Endl.)

Cedrol, mp. 86°, phenylurethane, mp. 106°, α - and β - pinenes, camphene, myrcene, limonene and traces of ocimene and p-cymene from oil (*Collect. Czech. Chem. Commun.* 1968, 33, 1939).

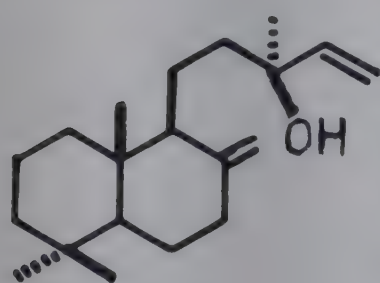
Distribution : Nepal, Sikkim and Bhutan, 1200 - 2400 m.

C. funebris Endl.; see *C. comeyana* Hort. ex Carriere

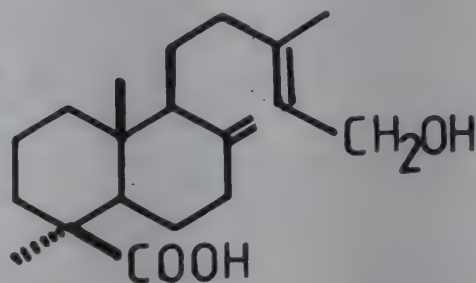
C. sempervirens L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 84).

d- α -Pinene, d- β -pinene, d-camphene, sabinene, car-3-ene, p-cymene, 4-terpineol, borneol, citronellal, terpinyl acetate, bornyl acetate, verbenone, ceranone, cadinene, isophyllocladene, cedrol and a new sesquiterpene - cupressusene - from oil of fresh fruits (*Perfum. Essent. Oil Record* 1959, 50, 823; *Chem. Abstr.* 1960, 54, 7980 h; *J. Am. Chem. Soc.* 1961, 83, 3114); communic acid, cupressic acid, isocupressic acid and two compounds, mp. 191° and 176°, from acidic fraction (*Tetrahedron Lett.* 1964, 2653; *Gazz. Chim. Ital.* 1964, 94, 1108; *Chem. Abstr.* 1965, 62, 5304 f); cupressuflavone from leaves (*Tetrahedron Lett.* 1964, 2995; *Tetrahedron* 1967, 23, 397; *Indian J. Chem.* 1971, 9, 98); two diterpene ketones (I,II) characterised from gum (*Gazz. Chim. Ital.* 1966, 96, 206; *Chem. Abstr.* 1966, 64, 17646 d); totarol, manool, feruginol, torulosal, torulosol, agathadiol, agatholal and new diterpene phenol - sempervirol, mp. 92° - from nonacidic fraction of resin (*Tetrahedron Lett.* 1967, 637); isolation, structure and synthesis of sempervirol (*Gazz. Chim. Ital.* 1967, 97, 908; *Chem. Abstr.* 1968, 68, 13196 x; *Gazz. Chim. Ital.* 1967, 97, 920; *Chem. Abstr.* 1968, 68, 13197 y).

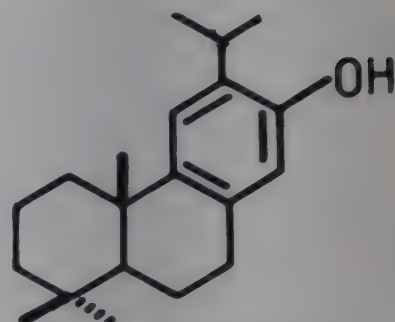
NEW COMPOUNDS



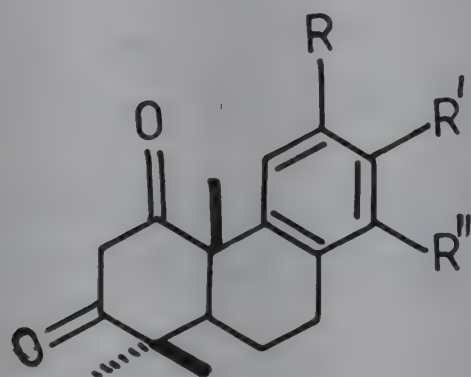
Cupressic acid



Isocupressic acid



Sempervirol

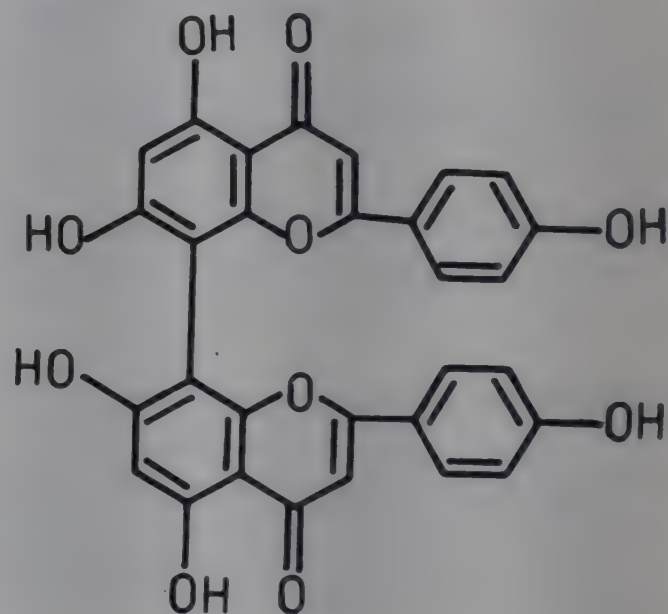


I

R = H, R' = OMe, R'' = iso-Pr.

II

R = OMe, R' = iso-Pr, R'' = H



Cupressuflavone

C. torulosa D. Don

Cupressuflavone, mp. 360°, isolated from leaves (*Tetrahedron Lett.* 1964, 2995; *Tetrahedron* 1967, 23, 397).

Distribution : Himalayas, Kashmir to Nepal, 1500-2400 m.

CURCUMA (Zingiberaceae)

C. amada Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 84).

d- α -Pinene, bp. 155°/176 mm., d-camphor, mp. 175°, l- β -curcumene as hydrochloride, mp. 83°, d-curcumene, mp. 115°, phytosterol and an unidentified compound mp. 142°, from rhizomes (*Indian J. Chem.* 1964, 2, 39).

C. longa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 85).

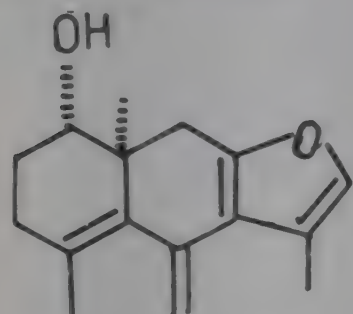
Curcumin, mp. 182°, isolated from rhizomes (*J. Indian Chem. Soc.* 1967, 44, 985).

C. zedoaria (Berg.) Rosc. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 85).

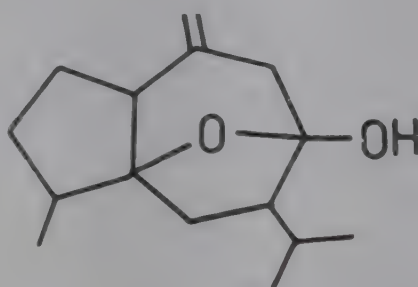
Isolation and structure of new sesquiterpenoid - curcumol, mp. 141° - from rhizomes

(*Chem. Pharm. Bull.* 1965, 13, 1484; *ibid.* 1966, 14, 1241); another sesquiterpenoid - zederone - isolated and its structure elucidated (*Chem. Pharm. Bull.* 1966, 14, 550; *ibid.* 1968, 16, 1081; *J. Chem. Soc. C* 1971, 688); - zedoarone, *bp.* 104°/3 mm., isolated and found identical with curzerenone (*Yakugaku Zasshi* 1968, 88, 792; *Chem. Abstr.* 1968, 69, 77524 f); a furanodiene (I), *mp.* 44°, from rhizomes (*Tetrahedron Lett.* 1968, 931); curcolone isolated, its structure and absolute configuration determined (*Chem. Pharm. Bull.* 1968, 16, 827); structure of curcumenol (*Chem. Pharm. Bull.* 1968, 16, 39); sesquiterpenoid - pyrocurzerenone, *mp.* 76° - from rhizomes (*Tetrahedron Lett.* 1968, 4417); structure of procurcumenol (*Chem. Pharm. Bull.* 1968, 16, 1605).

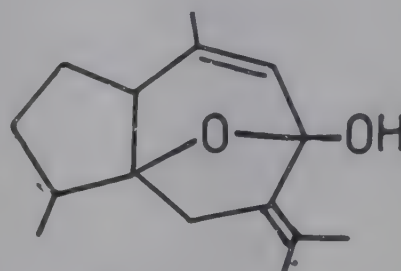
NEW COMPOUNDS



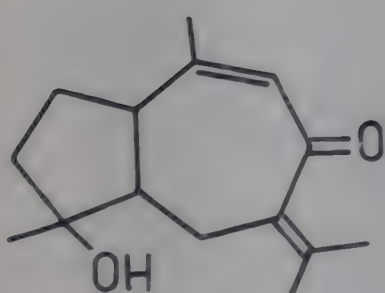
Curcolone



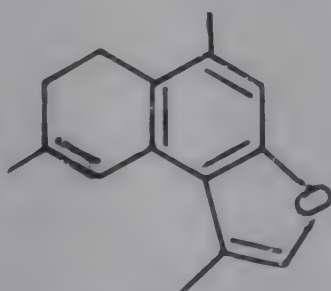
Curcumol



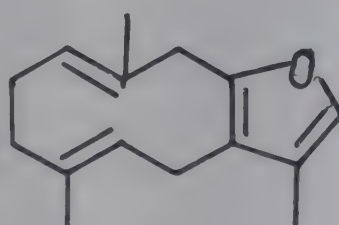
Curcumenol



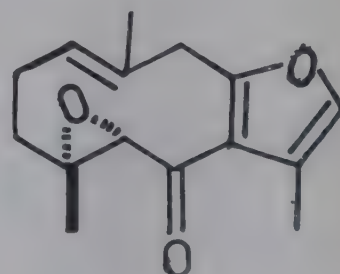
Procurcumenol



Pyrocurzerenone



I



Zederone

CUSCUTA (Cuscutaceae)

C. reflexa Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 85).

Dulcitol, luteolin, quercetin and a glycoside of luteolin, *mp.* 318°, isolated from stem (*Indian J. Chem.* 1964, 2, 378).

CYATHOCLINE (Asteraceae)

C. lyrata Cass.; see *C. purpurea* (D. Don) Kuntze

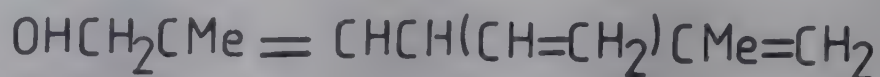
C. purpurea (D. Don) Kuntze syn. *C. lyrata* Cass.

Carvacrol (4.4) and a new keto phenol (7.3), p-cymene (15.0), d-camphor (7.8), citral (8.5), and cythoclol (7.0%) isolated from essential oil (*Perfum. Essent. Oil Record* 1961, 52, 555; *Chem. Abstr.* 1962, 56, 4481 e); a new sesquiterpene alcohol isolated (*Perfum. Essent. Oil Record* 1961, 52, 558; *Chem. Abstr.* 1962, 56, 4881 f); β -selinene (3.1) δ -selinene (3.5), camphor (3.0) thymol and its acetate (11.1), lyratol (20.2), lyratol acetate (49.9) and lyratoic acid (1.7%)

obtained by chromatography of essential oil, bp. $110^{\circ}/2$ mm.; structure and stereochemistry of lyratol (*Tetrahedron* 1969, 25, 3217; *Curr. Sci.* 1967, 36, 205).

Distribution : Sub-Himalayan tract from Kashmir to Bhutan, upto 1500 m.

NEW COMPOUNDS



Lyratol

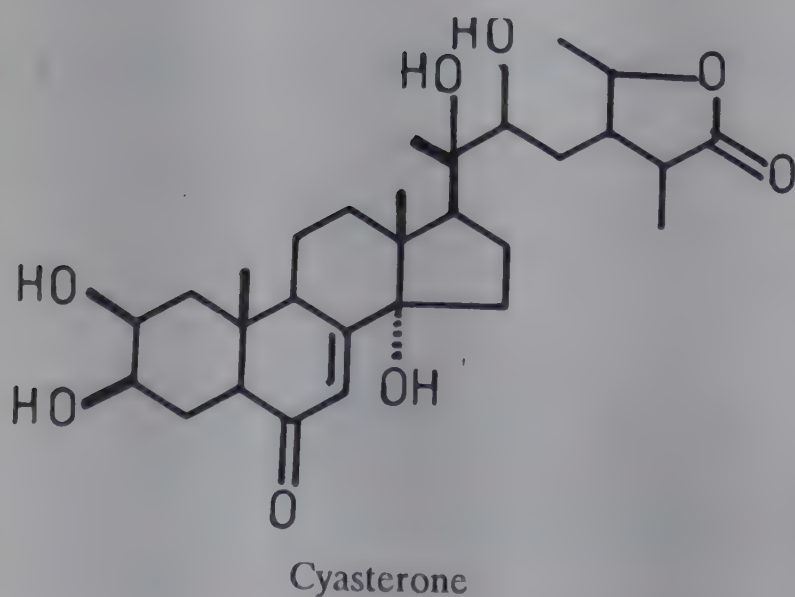
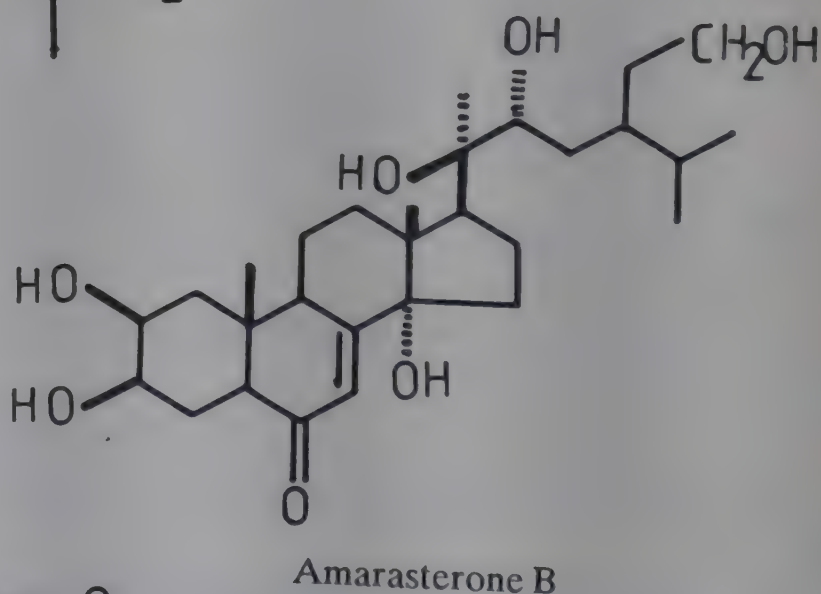
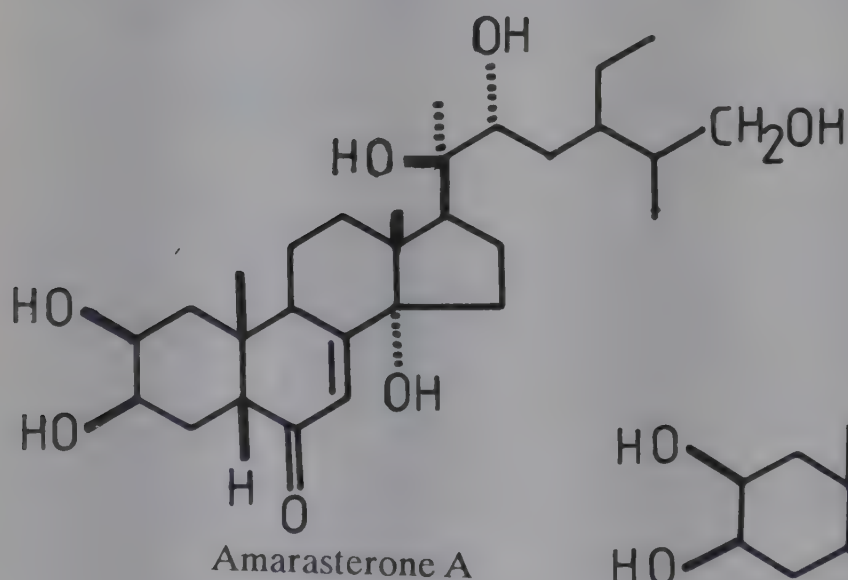
CYATHULA (Amaranthaceae)

C. capitata Moq.

Structure of a new insect-moulting compound - cyasterone, mp. 164° - from roots along with capitasterone, C29-ecdysterols and amarasterones A, mp. 210° , and B, mp. 284° (*Tetrahedron Lett.* 1967, 3191; *Tetrahedron* 1968, 24, 4895; *Tetrahedron Lett.* 1968, 4953).

Distribution : Temperate Himalayas from Himachal Pradesh to Sikkim, alt. 1800-2700 m.

NEW COMPOUNDS



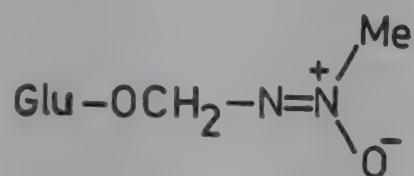
BIOLOGICAL ACTIVITY

Cyasterone showed moulting hormone activity in *Calliphora* bioassay (*Tetrahedron Lett.* 1967, 3191).

CYCAS (Cycadaceae)

C. circinalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 86).

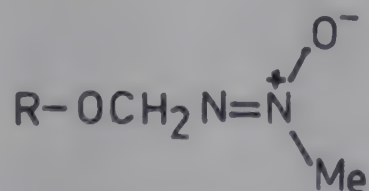
Cycasin, mp. 144°, isolated from nuts (*Nature* 1965, 206, 1363).

NEW COMPOUNDS

Cycasin

C. revoluta Thunb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 86).

Isolation of azoxy glycosides - macrozamin and neocycasin B - from Japanese cycad; latter identified as β -gentiobiosyloxy- azoxymethane (*Bull. Agric. Chem. Soc. Jpn.* 1959, 23, 556; *Chem. Abstr.* 1960, 54, 9006 d); glucosyloxymethyl-azoxymethane (cycasin) and rhamnobiosyloxymethyl-azoxymethane, mp. 162°, from seeds (*Jpn.* 14,798 (1960) Oct. 6; *Chem. Abstr.* 1961, 55, 14834 i); structure of neocycasin C elucidated as β -laminaritetraoxyloxy - azoxymethane (*Bull. Agric. Chem. Soc. Jpn.* 1960, 24, 536; *Chem. Abstr.* 1961, 55, 3448 c); cycasin isolated from male strobil and characterised along with neocycasins A and B, macrozamin and other unidentified glycosides; laminaribiose isolated from seeds (*Mem. Fac. Agric. Kagoshima Univ. Jpn.* 1960, 4, 5; *Chem. Abstr.* 1961, 55, 703 g); neocycasin E, mp. 156°, was isolated and characterised as β -cellobiosyloxy-azoxymethane (*Bull. Agric. Biol. Chem. Soc. Jpn.* 1961, 25, 937; *Chem. Abstr.* 1962, 56, 10578 f).

NEW COMPOUNDS

Macrozamin

R = Glu(6→1)Rha

Neocycasin B

R = Gentiobiose

Neocycasin C

R = Laminaribiose

Neocycasin E

R = Cellobiose

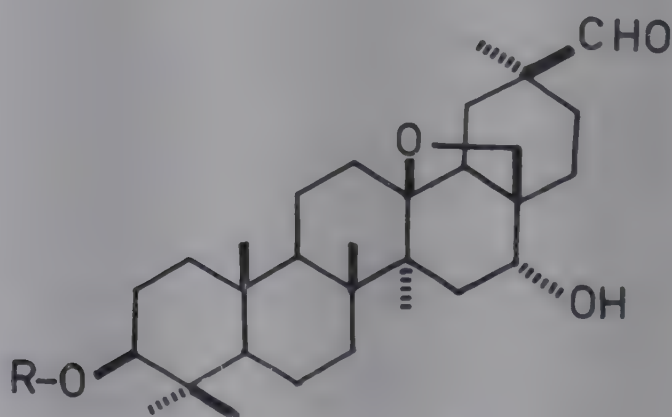
BIOLOGICAL ACTIVITY

Glucosyloxymethyl-azoxymethane (cycasin) and rhamnobiosylmethyl-azoxymethane useful for inhibiting growth of malignant tumors (Jpn. 14,798 (1960) Oct. 6; *Chem. Abstr.* 1961, 55, 14834 i). LD50 of cycasin was 0.51 mg/g, s.c., in mice. It was injected s.c. into mice with Ehrlich ascites cancer and antitumor activity was evaluated by survival rate; morphological changes in malignant cells were found to be similar to those caused by mitomycin C and nitromin (*Igaku Kenkyu* 1961, 31, 853; *Chem. Abstr.* 1961, 55, 26241 d).

CYCLAMEN (Primulaceae)

C. europaeum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 86).

Cyclamin (1%) isolated from fresh tubers (*Ann. Chem.* 1964, 680, 107); hydrolysis of amorph. saponin from corms yielded cyclamigenins; structure of cyclamigenin B elucidated (*Tetrahedron Lett.* 1963, 2223); cyclamin and deglucocyclamins I and II from bulbs and structure of cyclamin elucidated as 3 β -[O- β -D-glucopyranosyl-(1 \rightarrow 3)-[O- β -D-xylopyranosyl-(1 \rightarrow 2)]-O- β -D-glucopyranosyl-(1 \rightarrow 4)-[O- β -D-glucopyranosyl-(1 \rightarrow 2)- α -L-arabinopyranosyl]oxy-16 α -hydroxy-13 β ,28-epoxyolean-30-al (*Ann. Chem.* 1969, 721, 194).

NEW COMPOUNDS

Cyclamigenin B

R = H

Cyclamin

R = Ara[(2 \rightarrow 1)Glu](4 \rightarrow 1)Glu[2 \rightarrow 1)Xyl](3 \rightarrow 1)Glu

Deglucocyclamin I

R = Ara[(2 \rightarrow 1)Glu](4 \rightarrow 1)Glu(2 \rightarrow 1)Xyl)

Deglucocyclamin II

R = Ara(4 \rightarrow 1)Glu[(2 \rightarrow 1)Xyl](3 \rightarrow 1)Glu

C. persicum Miller (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 86).

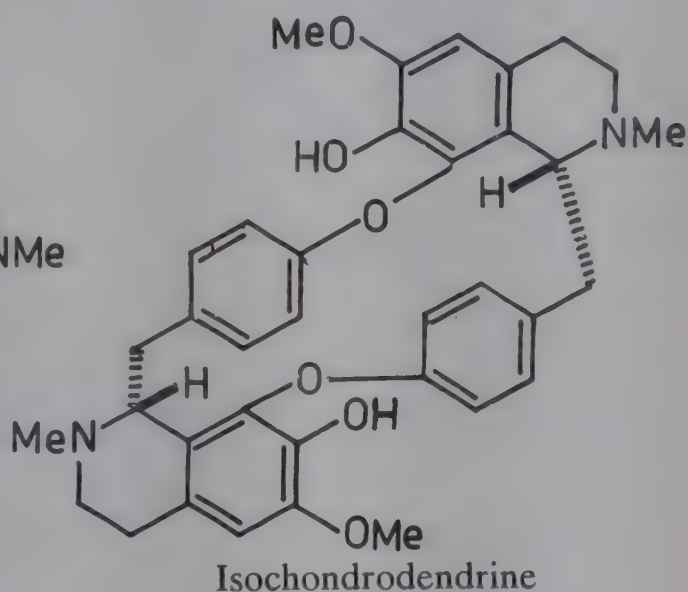
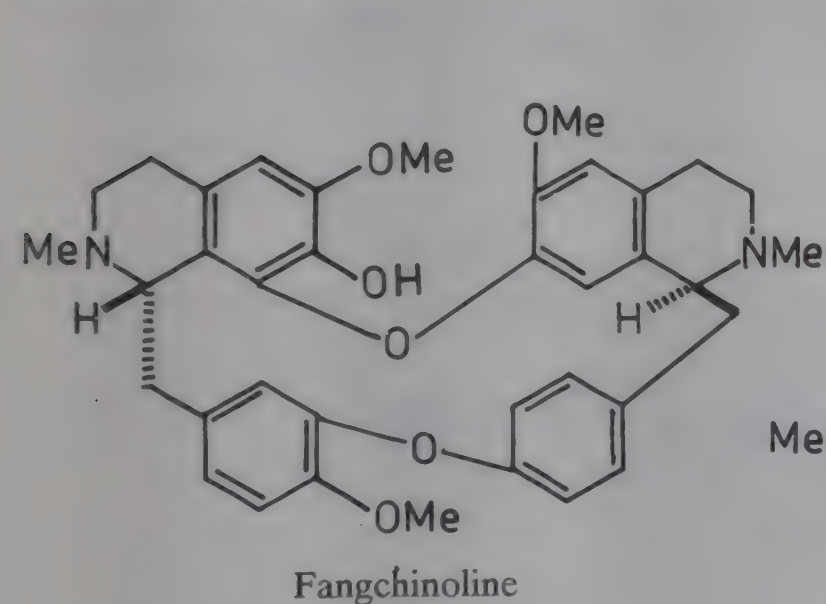
Alcoholic extract of tubers showed significant inhibitory activity against cells from human carcinoma of nasopharynx (*J. Pharm. Sci.* 1967, 56, 603).

CYCLEA (Menispermaceae)*C. peltata* (Lam.) Hook.f. & Thoms.

Tam.-Para

Alkaloids - fangchinoline, d-tetrandrine, dl-tetrandrine, d- isochondrodendrine - isolated from roots, showed pharmacological activity similar to that of d-tubocurarine (*J. Pharm. Sci.* 1961, 50, 164).

Distribution : North-east India including Khasi Hills and throughout western and eastern peninsula.

NEW COMPOUNDS**CYMBOPOGON** (Poaceae)

C. nardus (L.) Rendle syn. *Andropogon nardus* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 87).

Geraniol and citronellal obtained from oil (*Indian Oil Soap J.* 1965, 31, 180; *Chem. Abstr.* 1967, 67, 79638 d).

CYNANCHUM (Asclepiadaceae)

C. vincetoxicum Pers.; see *Vincetoxicum album* (Mill.) Aschers

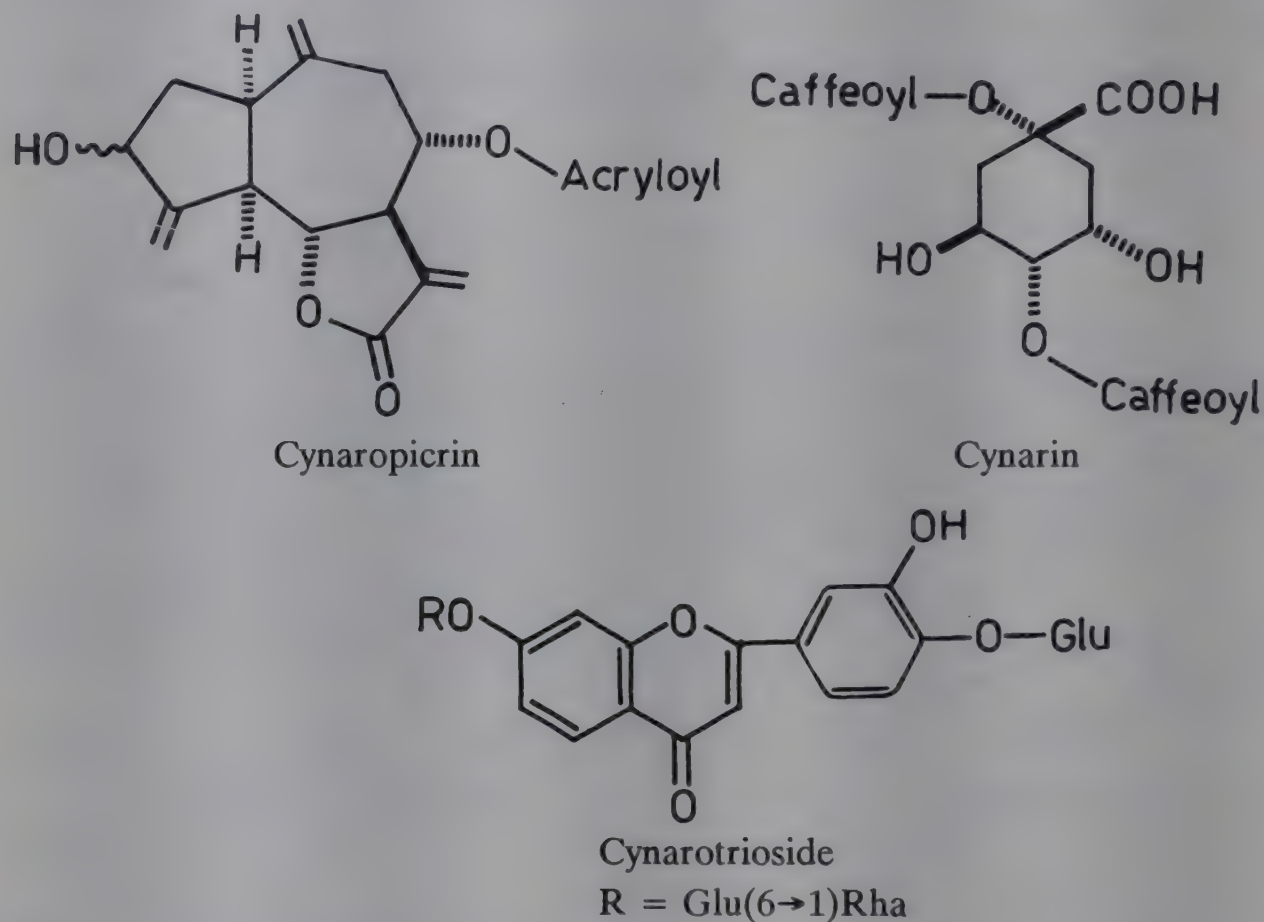
CYNARA (Asteraceae)

C. scolymus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 88).

Cynaropicrin isolated from leaves and structure elucidated (*Collect. Czech. Chem. Commun.* 1960, 25, 2777; *Tetrahedron Lett.* 1971, 4775; *Chem. Commun.* 1972, 386); taraxasterol, β -sitosterol, stigmasterol and cynarogenin from receptacles (*Egypt. Pharm. Bull.* 1962, 44, 19; *Chem. Abstr.* 1965, 62, 8116 b); cynarin, mp. 235°, from leaves (*Med. Prom. SSSR* 1965, 19, 13; *Chem. Abstr.* 1965, 63, 6786 b; *Experientia* 1979, 35, 993); cynarotrioside, mp. 274°, from leaves (*Khim. Pri. Soedin.* 1966, 2, 16; *Chem. Abstr.* 1966, 65, 3947 f); cynarolide, mp. 126°, from

leaves (*Diss. Pharm. Pharmacol.* 1968, 20, 217; *Chem. Abstr.* 1968, 69, 52330 b); caffeic acid, 1-,3-,4- and 5-caffeoyl, 1,4-dicaffeoyl-quinic acids, luteolin-7- β -D-glucoside and 7- β -rutinoside from leaves (*Fenol'nye Soedin. Ikh. Biol. Funkts. Mater. Vses. Simp.*, Ist 1966 (pub. 1968) 53; *Chem. Abstr.* 1969, 71, 19515 j).

NEW COMPOUNDS



CYPERUS (Cyperaceae)

C. esculentus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 88).

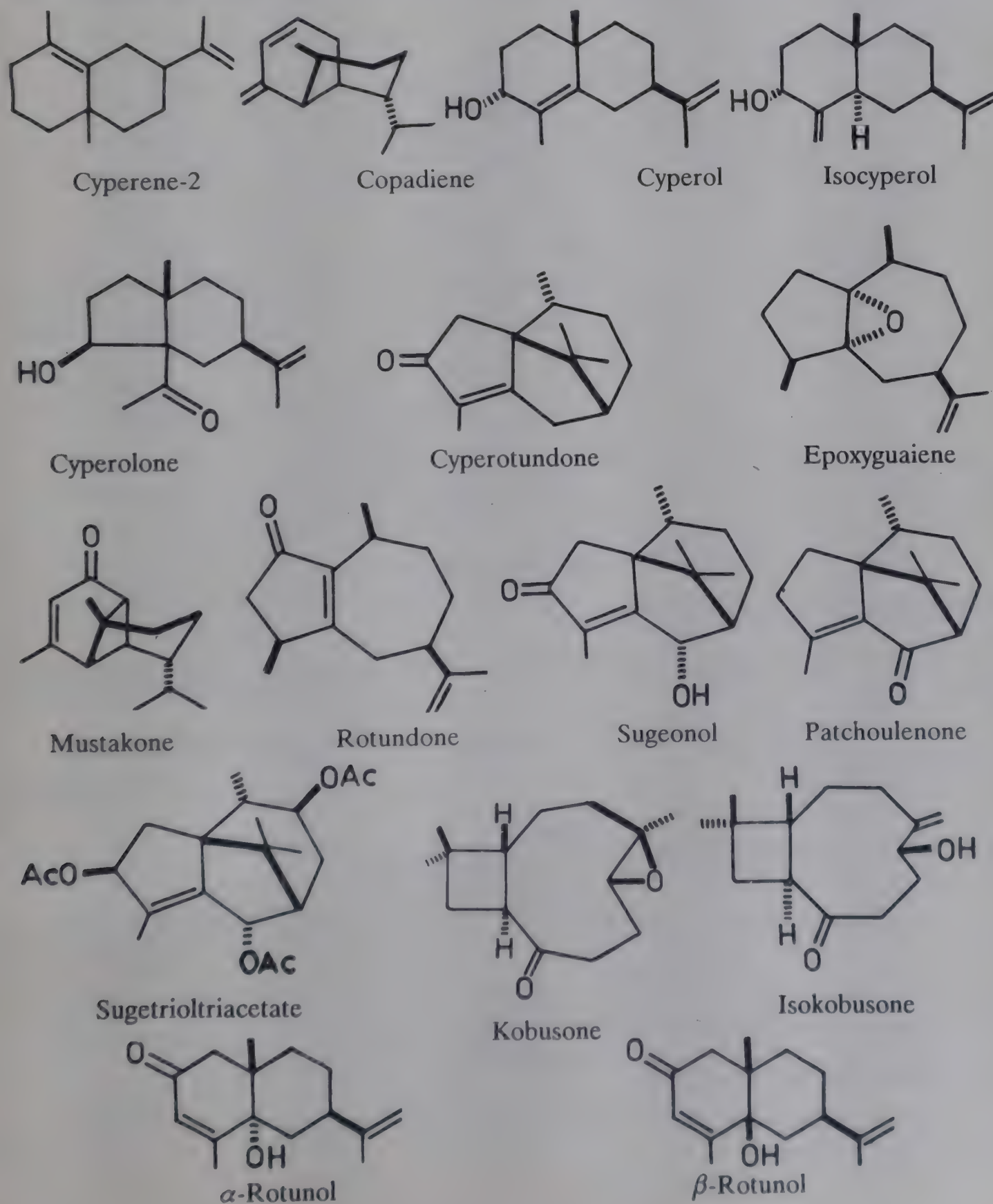
β -Sitosterol from tubers (*J. Org. Chem.* 1960, 25, 1269).

C. rotundus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 88).

Cyperene-1 (a tricyclic sesquiterpene) and cyperene-2 (a bicyclic sesquiterpene hydrocarbon) isolated from tubers (*Glasnik Sumarskog. Fak. Univ. Beogradu* 1959, 17, 82; *Chem. Abstr.* 1963, 58, 3462 g); patchoulene, mp. 52° (*Chem. Ind.* 1963, 1284); a new sesquiterpene ketone - mustakone, bp. 128°/1mm. - from essential oil, has same skeleton as copaene (*Tetrahedron Lett.* 1963, 1933); isolation, structure and absolute configuration of cyperotundone (cyperenone), mp. 46°, from tubers (*Chem. Pharm. Bull.* 1965, 13, 628; *ibid.* 1966, 14, 890); cyperolone, mp. 41°, from tubers (*Chem. Pharm. Bull.* 1966, 14, 1439); a new sesquiterpenoid - sugetriol triacetate, mp. 132° - from tubers of Japanese nutgrass (*Chem. Pharm. Bull.* 1967, 15, 1433); 27 compounds separated from essential oil by GLC and four of these -

copadiene, bp. $130^{\circ}/1$ mm., epoxyguaiene, bp. $102^{\circ}/1$ mm., rotundone, bp. $128^{\circ}/1$ mm. and cyperolone, bp. $120^{\circ}/0.1$ mm. - characterised (*Tetrahedron Lett.* 1967, 4661); sesquiterpenic ketol - sugeonol (*Chem. Pharm. Bull.* 1968, 16, 52); structure and absolute configuration of cyperol and isocyperol (*Chem. Pharm. Bull.* 1967, 15, 1929); structure of α -rotunol, mp. 87° , and β -rotunol, mp. 118° (*Tetrahedron Lett.* 1969, 2741); two norsesquiterpenoids - kobusone and isokobusone (*Chem. Pharm. Bull.* 1969, 17, 1390).

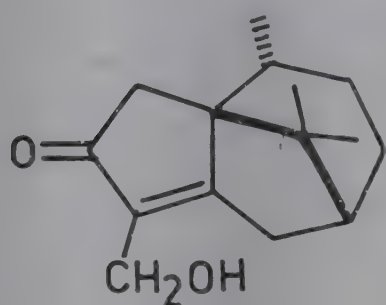
NEW COMPOUNDS



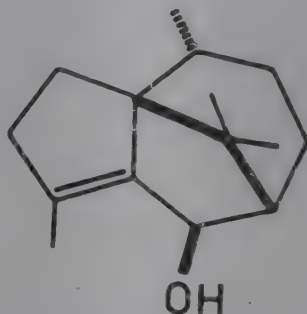
C. scariosus R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 89).

Isopatchoulene, mp. 48°, from essential oil (*Tetrahedron Lett.* 1965, 4053); a new sesquiterpene ketone - cyperenone - from essential oil (*J. Pharm. Sci.* 1965, 54, 1823); two new crystalline sesquiterpene alcohols - cyperenol, mp. 94° and patchoulene, mp. 74° - from essential oil (*Tetrahedron Lett.* 1967, 2447); isolation of a ketone - cyperotundone (*Tetrahedron* 1969, 23, 2169); structure and stereochemistry of a new sesquiterpene - scariodione (*Sci. Cult.* 1969, 35, 110).

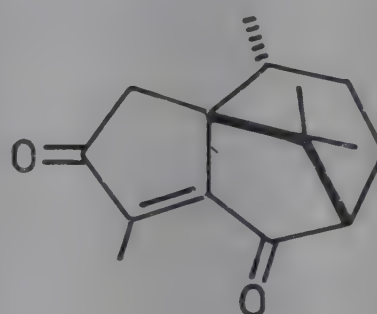
NEW COMPOUNDS



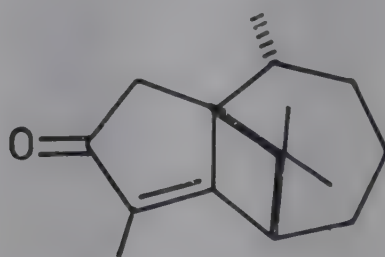
Cyperenol



Patchoulene



Scariodione



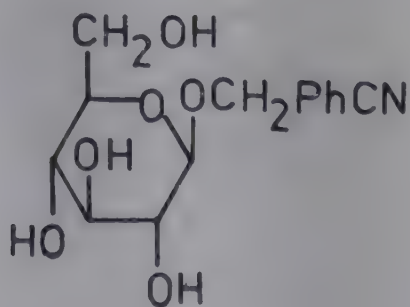
Isopatchoulene

CYSTOPTERIS (Athyriaceae)

C. fragilis (L.) Bernh. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 89).

Prunasin isolated (*Dansk Tidsskr. Farm.* 1968, 42, 301; *Chem. Abstr.* 1969, 71, 10244 n).

NEW COMPOUNDS



Prunasin

C. montana (Lam.) Bernh. ex Desv.

Prunasin isolated (*Dan. Tidsskr. Farm.* 1968, 42, 301; *Chem. Abstr.* 1969, 71, 10244 n).

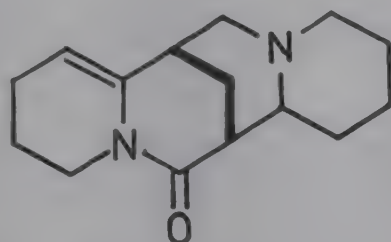
Distribution : Kashmir.

CYTISUS (Papilionaceae)*C. monspessulanus* L.

Eng. - White broom.

Structure of monspessulanine proposed as (+)5,6-dihydro-10-oxo- α -isoparteine (*J. Chem. Soc.* 1964, 4613).

Distribution : Introduced into India and naturalised in Nilgiri Hills.

NEW COMPOUNDS

Monspessulanine

C. scoparius (L.) Link; see *Sarothamnus scoparius* (L.) Wimm. ex W.D.J. Koch.

DACTYLIS (Poaceae)*D. glomerata* L.

Eng. - Cocksfoot grass, Orchard grass.

Analysis of xylan isolated from plant gave xylose (50.0), arabinose (22.0), glucose (8.0), galactose (7.0), uronic anhydride (8.0) and ash (1.5%); xylan consisted of 1,4-linked xylopyranose units substituted in some at 2-position by 4-O-methyl-D-glucuronic acid and in some at 3-position by L- arabinofuranose or xylopyranose units (*J. Chem. Soc.* 1960, 3877).

Distribution : North-west Himalayas from Kashmir to Kumaon, alt. 2400-3000 m., Nilgiris 2000-2400 m.

DAEMIA (Asclepiadaceae)

D. extensa R. Br.; see *Pergularia daemia* (Forsk.) Choiv.

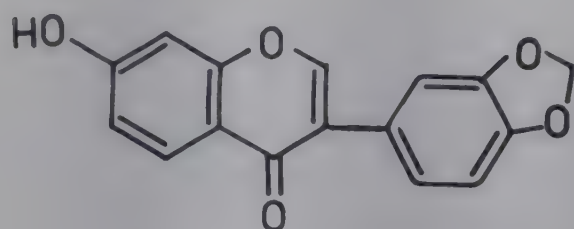
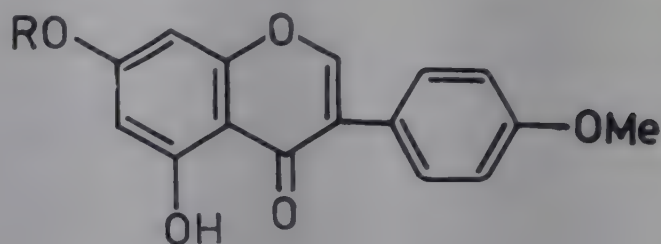
DALBERGIA (Papilionaceae)

D. lanceolaria L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 90).

Antiarthritic activity has been observed in different extracts of plant (*Indian J. Med. Res.* 1966, 54, 363).

Lanceolarin, mp. 165°, from root bark, characterised as biochanin A-7-apiosyl-glucoside (*Tetrahedron Lett*, 1965, 3191; *Tetrahedron* 1967, 23, 405); ψ -baptigenin isolated from flowers and leaves identified as 7-hydroxy-3',4'-methylenedioxyisoflavone (*Curr. Sci.* 1967, 36, 484).

NEW COMPOUNDS

 ψ -Baptigenin

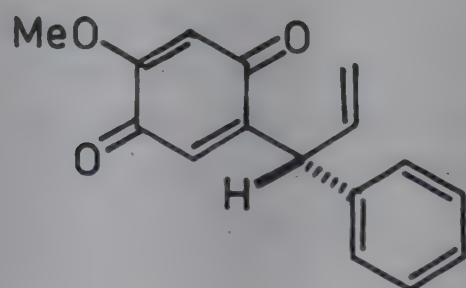
Lanceolarin

R = Glu-Apiose

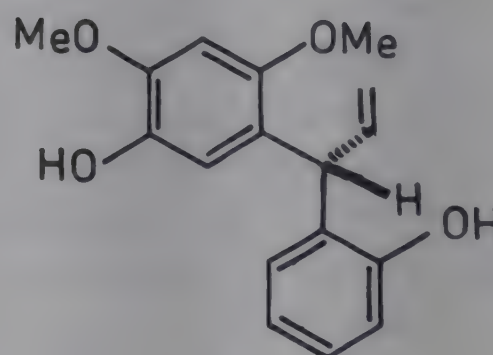
D. latifolia Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 90).

Latifolin, mp. 122°, isolated from heartwood and bark (*Tetrahedron* 1962, 18, 1503; *Tetrahedron Lett.* 1963, 211; *Bull. Nat. Inst. Sci. India* No. 31, 1965, 165; *Chem. Abstr.* 1967, 66, 26567 c); latifolin, dalbergin, dalberginone and a red quinone - dalatinone - isolated from heartwood (*Chem. Ind.* 1963, 491; *Tetrahedron Lett.* 1963, 211; *Phytochemistry* 1965, 4, 337; *Tetrahedron* 1965, 21, 2683); a phenol, mp. 123°, hentriacontane, β -sitosterol, sucrose and tannins from bark (*Bull. Nat. Inst. Sci. India* No. 31, 1965, 165; *Chem. Abstr.* 1967, 66, 26567 c); liquiritigenin and dalberginoids isolated (*Indian J. Chem.* 1965, 3, 422).

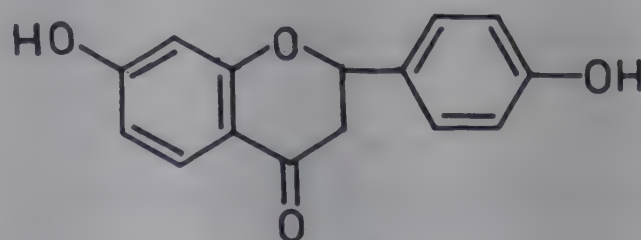
NEW COMPOUNDS



Dalberginone



Latifolin



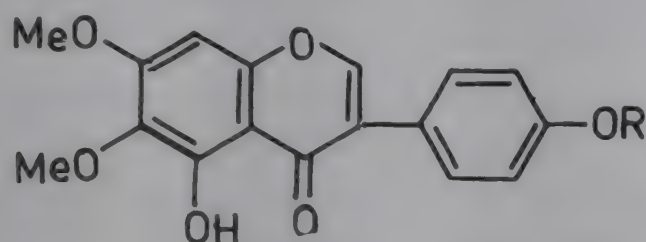
Liquiritigenin

D. sissoo Roxb. ex DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 90).

Biochanin A, tectorigenin and a new isoflavone - 5,4'-dihydroxy-6,7-dimethoxyisoflavone (7-O-methyltectorigenin)- from flowers (*Indian J. Chem.* 1963, 1, 25); synthesis of 7-O-methyltectorigenin (*Periodica Polytech.* 1964, 8, 123; *Chem. Abstr.* 1965, 63, 5590 e); isolation of 7-O-methyltectorigenin from immature green pods (*Indian J. Chem.* 1965, 3, 474); biochanin A-7-glucoside (sissortin) and an isoflavone-O-glycoside isolated from leaves (*Bull.*

Nat. Inst. Sci. India No. 31, 1965, 86; *Chem. Abstr.* 1967, 66, 46559 e); a new isoflavone from flowers identified as 5-hydroxy-6,7,4'-trimethoxyisoflavone (I), mp. 184° (*Curr. Sci.* 1966, 34, 431).

NEW COMPOUNDS



I

R = Me

7-O-methyltectorigenin

R = H

DAPHNE (Thymelaeaceae)

D. bholua Buch.- Ham. ex D. Don syn. *D. cannabina* sensu Hook.f., p.p.

Taraxerone isolated from leaves (*Curr. Sci.* 1967, 36, 99); daphnoretin and β -sitosterol from bark, stem and roots (*J. Indian Chem. Soc.* 1968, 45, 1058).

Distribution : Eastern Himalayas, 1800-3000 m.

D. cannabina Hook.f. see *D. bholua* Buch.- Ham. ex D. Don,

D. papyracea Wall. ex Steud.

D. papyraceae Wall. ex Steud. syn. *D. cannabina* sensu Hook.f., p.p. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 90).

Sterol, mp. 131°, and three glycosides - G-1, mp. 196°, G-2, mp. 175°, and amorph. G-3 - isolated from roots; G-1 and G-3 identified as flavonoid glucosides but not characterised (*Curr. Sci.* 1962, 31, 463); daphnin, mp. 225°, isolated from roots (*Indian J. Chem.* 1964, 2, 501).

DATISCA (Datisceae)

D. cannabina L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 90).

Flavonoids - datisechin, galangin and isalpinin - isolated from root cortex (*Khim. Prir. Soedin.* 1969, 5, 179; *Chem. Abstr.* 1969, 71, 98962 d).

DATURA (Solanaceae)

D. fastuosa L.; see *D. metel* L.

D. innoxia Mill. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 91).

Hyoscyamine, hyoscyne and meteloidine isolated from leaves and roots; 7-hydroxy-3,6-bis-tigloyloxytropene, (-)-3 α ,6 β -bis-tigloyloxytropene, tropine and pseudotropine from roots (*J. Pharm. Pharmacol.* 1965, 17, 115; *Farmatsiya* 1967, 17, 37; *Chem. Abstr.* 1968, 68, 6129 z); scopolamine and unknown alkaloid isolated from aerial parts (*Farmatsiya* 1967, 17, 37; *Chem. Abstr.* 1968, 68, 6129 z; *Rom.* 51,183 (1968) Aug. 14; *Chem. Abstr.* 1969, 70, 71064 e).

D. metel L. syn. *D. fastuosa* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 91).

Scopolamine (0.121%) isolated from total alkaloids (0.233%) from seeds; also from leaves (*Farmacia* 1959, 7, 235; *Chem. Abstr.* 1960, 54, 11376 d; *Farm. Zh.* 1961, 16, 35; *Chem. Abstr.* 1962, 56, 14394 b); hyoscyne and hyoscyamine isolated from leaves, flowers, aerial parts and roots (*Indian J. Pharm.* 1963, 25, 370; *Lloydia* 1965, 28, 71); atropine, fastunine, mp. 88°, fastudine, mp. 98° and fastusidine isolated from seeds (*Sci. Res.* 1966, 3, 212; *Chem. Abstr.* 1968, 68, 29909 t); daturanolone, mp. 273° and fastusic acid, mp. 202°, isolated from seeds (*Pakistan J. Sci. Ind. Res.* 1967, 10, 85; *Chem. Abstr.* 1968, 68, 66374 k; *Sci. Res.* 1968, 5, 66, *Chem. Abstr.* 1968, 69, 65148 y).

D. quercifolia H.B. & K.

Tam. - Vellummatti.

Scopolamine (0.108%) isolated from total alkaloids (0.273%) from seeds (*Farm. Zh.* 1961, 16, 35; *Chem. Abstr.* 1962, 56, 14394 b).

Distribution : Peninsular India (Tamil Nadu).

D. stramonium L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 91).

Isolation of hyoscyamine, hyoscyne and scopolamine from plant and seeds (*Bull. Fac. Pharm.* 1961, 1, 177; *Chem. Abstr.* 1964, 60, 13570 d; *Aptech. Delo.* 1962, 11, 29; *Chem. Abstr.* 1964, 60, 13093 g); occurrence of 6-hydroxyhyoscyamine in a hybrid between *D. stramonium* and *D. ferox* (*Naturwiss.* 1962, 49, 281; *Chem. Abstr.* 1962, 57, 7627 f); biogenesis of tropic acid and *Datura* alkaloids (*J. Am. Chem. Soc.* 1960, 82, 612).

D. suaveolens Humb. & Bonpl. ex Willd.

Eng. - Angel's trumpet

Determination of hyoscyne (80%) in alkaloids from leaves (*Proc. Nat. Acad. Sci. India* 1965, 34A, 261; *Chem. Abstr.* 1965, 63, 431 g).

Distribution : Native of Brazil, naturalised in lower hills of western and eastern Himalayas upto 1200 m.

DAUCUS (Apiaceae)

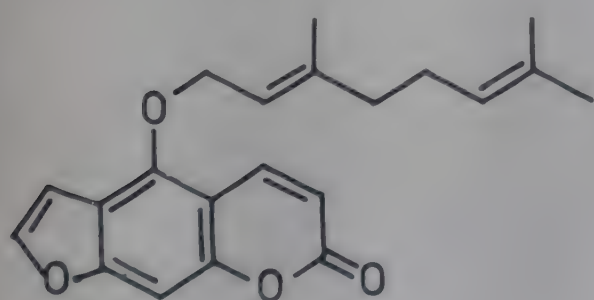
D. carota L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 91).

Aqueous extract of seeds showed spasmodic action on smooth muscles of isolated ileum

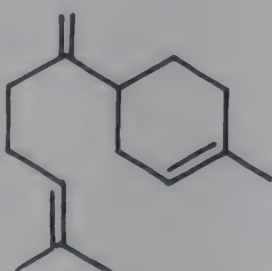
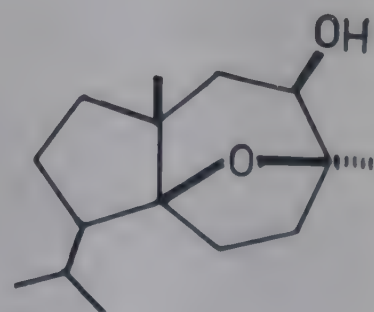
and trachea and rectus abdominis muscle of frog. Use of drug as carminative may be due to its cholinergic action on smooth muscles of gastrointestinal system (*India J. Med. Res.* 1966, 54, 178); aqueous suspension (2%) of essential oil produced transient fall of blood pressure in anaesthetised dog without influencing respiration, but higher doses produced persistent hypotension; it did not show any analgesic effect in rats but exerted marked CNS depressant action in rats and fish (*Indian J. Pharm.* 1967, 29, 127).

Volatile oil, an aldehyde, mp. 112° and a compound mp. 230° , isolated from fruits (Yao Hsueh Hsueh Pao 1957, 5, 157; *Chem. Abstr.* 1962, 56, 540 h); a new sesquiterpene - (+)daucene, bp. $96^{\circ}/4\text{ mm}$ - from essential oil (*Dokl. Akad. Nauk SSSR* 1961, 141, 1384; *Chem. Abstr.* 1962, 56, 14332 d); analysis of oil showed presence of α -pinene, nopinene, sabinene, dipentene, p-thymol, linalool, geraniol, bergamottin, β -bisabolene (*J. Chem. Soc.* 1961, 2246; *Zh. Prikl. Khim.* 1962, 35, 1355; *Chem. Abstr.* 1962, 57, 11325 d; *J. Org. Chem.* 1966, 31, 348); a sesquiterpene alcohol, mp. 119° , from essential oil of wild carrot (*Zh. Obshch. Khim.* 1962, 32, 2365; *Chem. Abstr.* 1963, 58, 7980 d); linalool, geraniol, geranyl acetate, α - and β - pinene, sabinene, limonene, bergamotene, bisabolene, daucene, carotol, daucol, p-thymol, α -curcumene, asarone and elemicin from essential oil of fruits of wild carrot growing in Northern Caucasus; farnesene and β -elemene also isolated (*Rastit. Resur.* 1965, 1, 227; *Chem. Abstr.* 1965, 63, 9737 g; *Khim. Priro. Soedin.* 1966, 2, 290; *Chem. Abstr.* 1967, 66, 22109 g; *Rastit. Resur.* 1966, 2, 527; *Chem. Abstr.* 1967, 66, 79489 k); structure of daucol (*J. Org. Chem.* 1961, 26, 981; *Bull. Soc. Chim. Fr.* 1964, 2020); choline and a quaternary base isolated from seeds (*Indian J. Med. Res.* 1966, 54, 1053); a diglycoside of cyanidin isolated from var. *sativa* DC. (*J. Sci. Ind. Res.* 1962, 21B, 591).

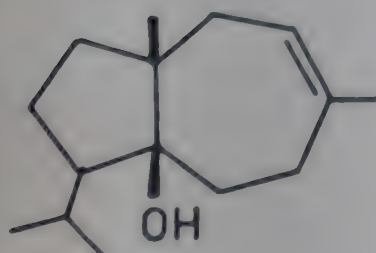
NEW COMPOUNDS



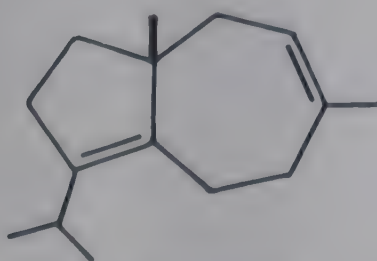
Bergamottin

 β -Bisabolene

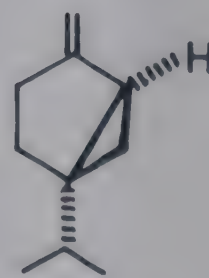
Daucol



Carotol



(+)Daucene



Sabinene

DELONIX (Caesalpiniaceae)

D. elata (L.) Gamble syn. *Poinciana elata* L. (*Glossary Indian Med. Plants*, Chopra, Nayar &

Chopra, PID, New Delhi, 1956, p. 92).

(-)-L-Asparagine and aspartic acid isolated from trunk bark (*Curr. Sci.* 1966, 35, 437).

D. regia (Boj. ex Hook.) Rafin. syn. *Poinciana regia* Boj. ex Hook.

Eng. - Gold mohar, Flamboyant, Flame Tree; H. - Gulmohar; Tam. - Mayarum; Tel. - Shima sankesula.

Leucocyanidin isolated from bark (*Curr. Sci.* 1966, 35, 437); lupeol from bark (*J. Indian Chem. Soc.* 1968, 45, 464).

Distribution : Planted in avenues and gardens throughout the plains of India.

DELPHINIUM (*Ranunculaceae*)

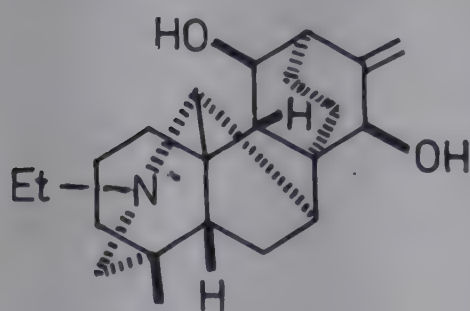
D. ajacis L.; see *Consolida ambigua* (L.) Ball. & Heywood

D. consolida L.; see *Consolida regalis* S.F. Gray

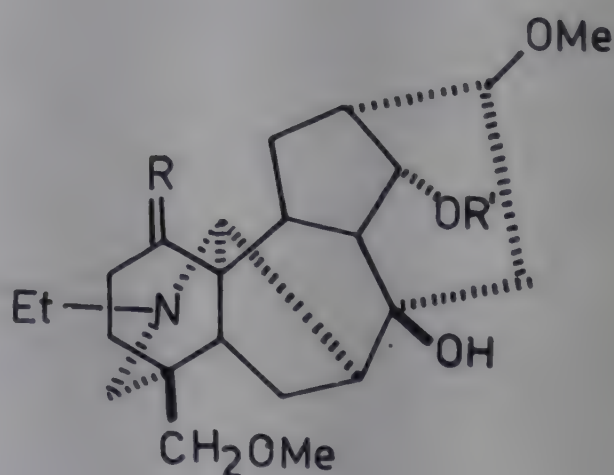
D. denudatum Wall. ex Hook. f. & Thoms. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 92).

Isolation and structure of two new diterpene alkaloids - denudatine, mp. 248° and denudatidine, mp. 273° - from roots (*J. Sci. Ind. Res.* 1961, 20B, 39; *Chem. Ind.* 1961, 1909; *J. Pharm. Pharmacol.* 1962, 14, 288; *Tetrahedron Lett.* 1969, 4369); in addition β -sitosterol and its glucoside, an unsaturated hydrocarbon and a monohydric alcohol isolated from roots (*Pakistan J. Sci. Ind. Res.* 1965, 8, 173; *Chem. Abstr.* 1967, 67, 51050 g); structure elucidation of condelphine, talatizidine and isotalatizidine (*Tetrahedron Lett.* 1966, 4217; *J. Am. Chem. Soc.* 1967, 89, 4146); crystal structure of denudatine (*Tetrahedron Lett.* 1969, 4373; *Chem. Commun.* 1970, 359).

NEW COMPOUNDS



Denudatine



Condelphine

R = H, α -OH, R' = Ac

Isotalatizidine

R = H, α -OH, R' = H

Talatizidine

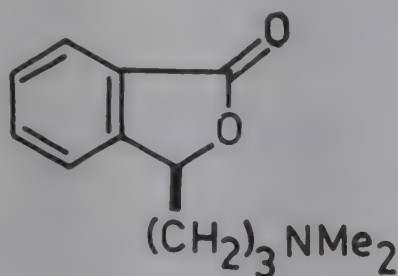
R = H, β -OH, R' = H

DENDROBIUM (Orchidaceae)

D. aphyllum (Roxb.) G.E.C. Fischer syn. *D. pierardii* Roxb.

Pierardine isolated (*Acta Chem. Scand.* 1969, 23, 2177).

Distribution : Nepal to Bhutan and Khasi Hills.

NEW COMPOUNDS

Pierardine

D. chrysanthum Wall. ex Lindl.

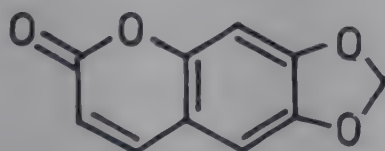
Hygrine isolated (*Acta Chem. Scand.* 1965, 19, 1607).

Distribution : Nepal, Sikkim, 600-1500 m. and Khasi Hills.

D. densiflorum Lindl. syn. *D. thyrsiflorum* Reichb. f.

Ayapin, scopoletin and 6,7-dimethoxycoumarin isolated from leaves (*Nature* 1960, 188, 1108).

Distribution : Nepal to Bhutan and Khasi Hills.

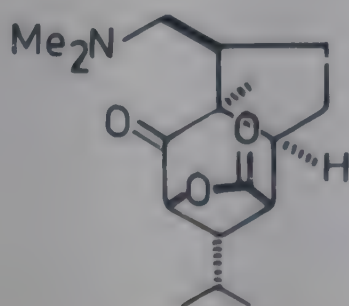
NEW COMPOUNDS

Ayapin

D. nobile Lindl.

Isolation and structure of new alkaloid - dendrobine, mp. 134° (*Yakugaku Zasshi* 1963, 83, 1184; *Chem. Abstr.* 1964, 60, 10734 h; *Chem. Pharm. Bull.* 1965, 13, 745); isolation and structure of dendrine, mp. 191° (*Tetrahedron Lett.* 1965, 2773; *Acta Chem. Scand.* 1970, 24, 1108); isolation and structure of dendramine, mp. 186° (*Chem. Pharm. Bull.* 1966, 14, 668); structure of nobilonine, mp. 85° (*Chem. Pharm. Bull.* 1965, 13, 745).

Distribution : Nepal to Bhutan and Khasi Hills, ascending to 1500 m.

NEW COMPOUNDS

Nobilonine

02261

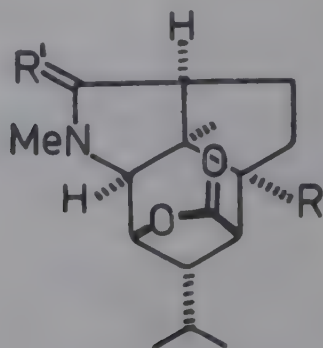
DR 435

COMBODY HEALTH CELL

326, V Main, 1 Block

Kolkata-700014

Bangalore-560024



Dendramine

R = OH, R' = H,H

Dendrine

R = H, R' = H, α -CH₂COOMe

Dendrobine

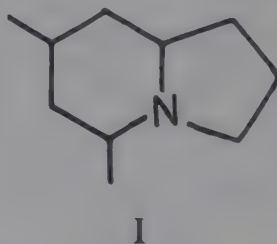
R = H, R' = H,H

D. pierardii Roxb.; see *D. aphyllum* (Roxb.) G.E.C. Fischer*D. primulinum* Lindl.

Hygrine and 5,7-dimethyloctahydroindolizine (I) isolated (*Acta Chem. Scand.* 1965, 19, 1607).

Distribution : Nepal and Sikkim.

NEW COMPOUNDS



I

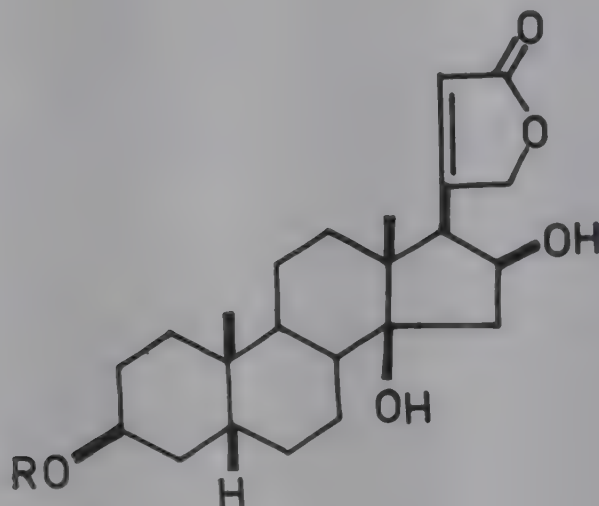
D. thyrsiflorum Reichb. f.; see *D. densiflorum* Lindl.

DENDROPTHOE (Loranthaceae)

D. falcata (L.f.) Ettingshausen syn. *Loranthus longiflorus* Desr. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 93).

Strospeptide, mp. 253°, neritaloside, mp. 135° and odorside F, mp. 233°, isolated from leaves of plant growing on *Nerium oleander* (*Aust. J. Chem.* 1961, 14, 449).

NEW COMPOUNDS



Strospeptide

R = 6-Deoxy-3-O-methyl-D-galactose

Odoroside F

R = β -D-Glucosyl-D(3-O-methyl)glucose

DERRIS (Papilionaceae)

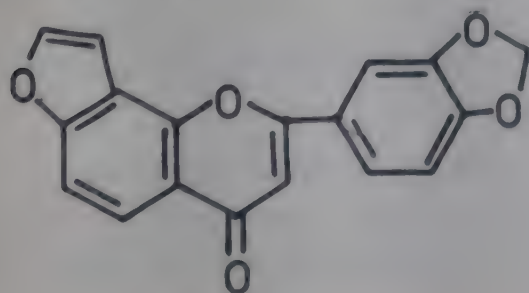
D. elliptica (Wall.) Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 93).

Biosynthesis of rotenone and amorphin (*Chem. Commun.* 1965, 155).

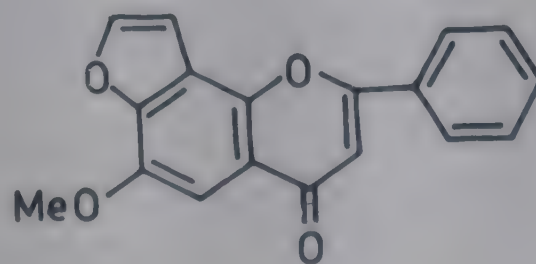
D. indica (Lamk.) Bennet. syn. *Pongamia glabra* Vent., *P. pinnata* (L.) Pierre (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 201).

β -Sitosterol isolated from seeds (*Indian J. Appl. Chem.* 1959, 22, 86; *Chem. Abstr.* 1960, 54, 8999 d); karanjin, pongamol, new pongaglabrone, mp. 233° and pongapin isolated from seeds; pongaglabrone identified as 3',4'-methylenedioxyfurano-[2',3'',7,8]flavone (*Tetrahedron* 1963, 19, 219); a new furoflavone - 6-methoxyfurano[2'',3'',7,8]flavone(6-methoxy-4-oxo-2-phenyl- furo[2,3-h]-1-benzopyran) - isolated from seeds (*J. Chem. Soc.* 1963, 163); in addition, kangone isolated from seeds; waxes, kaempferol and γ -sitosterol from flowers; kanugin from roots and demethoxykanugin from stem bark (*Beitr. Biochem. Physiol. Naturstoffen Festschr.* 1965, 251; *Chem. Abstr.* 1966, 64, 18024 e; *Tetrahedron* 1969, 25, 1063); a new chromenoflavone - pongachromene - isolated from stem bark and structure determined (*Tetrahedron* 1969, 25, 1063).

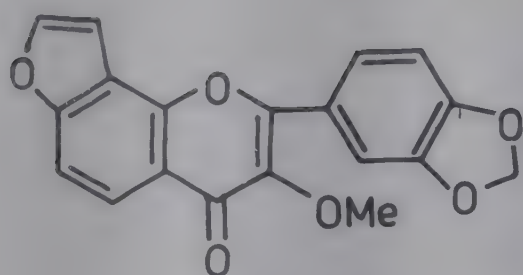
NEW COMPOUNDS



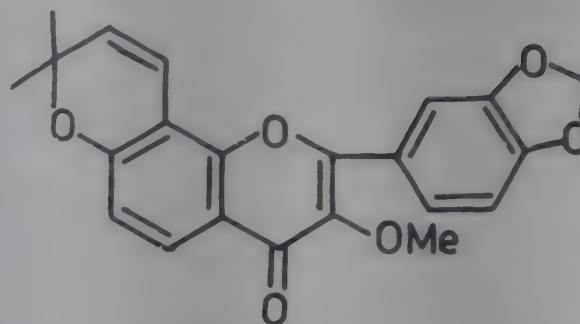
Pongaglabrone



6-Methoxyfuroflavone



Pongapin

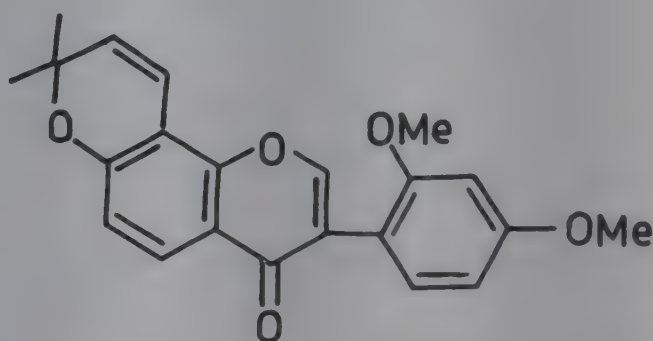


Pongachromene

D. malaccensis Prain (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 93).

Confirmation of structure of isoflavone (I), isomeric with toxicarol, from plant resin (*J. Chem. Soc.* 1965, 4203).

NEW COMPOUNDS



I

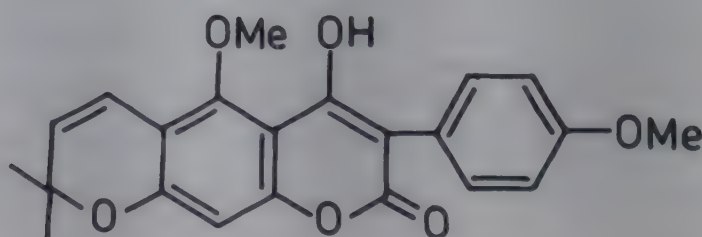
D. robusta Benth.

Kumaon. - Buro; Assam - Mouhita, Hitkura

Structure of robustic acid as new 4-hydroxy-3-phenylcoumarin derivative was elucidated and confirmed by synthesis (*J. Chem. Soc. C* 1966, 606).

Distribution : Himalayas from Kumaon eastwards (lower hills), Assam and western part of peninsular India.

NEW COMPOUNDS



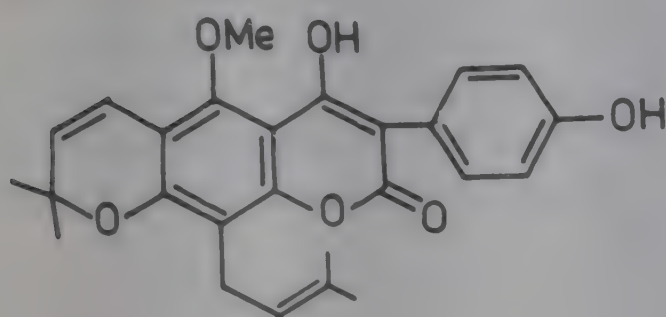
Robustic acid

D. scandens (Roxb.) Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 94).

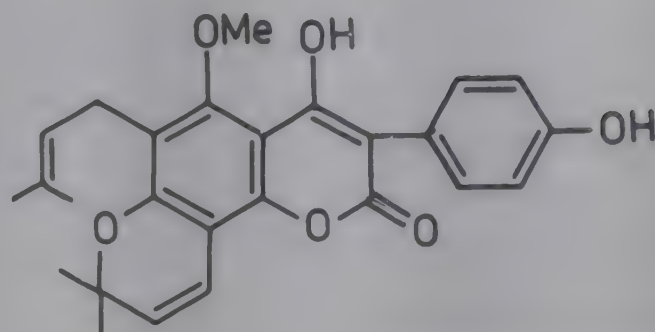
Scandenin isolated from roots (*J. Sci. Ind. Res.* 1961, 20B, 87); lonchocarpic acid and scandenin belong to new group of 4-hydroxy-3-phenylcoumarins, their structures elucidated (*J. Chem. Soc. C* 1966, 192); osajin and two new isoflavones - scandenone and scandinone -

isolated from roots and characterised (*J. Chem. Soc. C* 1966, 701).

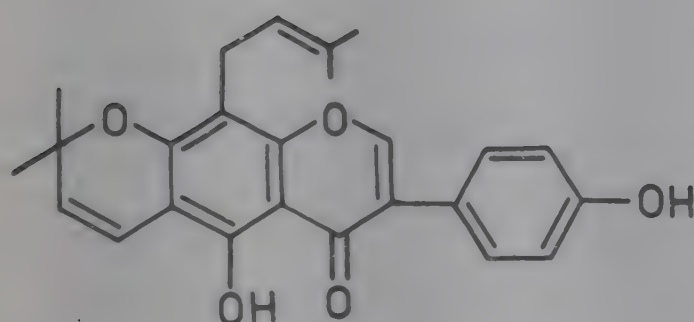
NEW COMPOUNDS



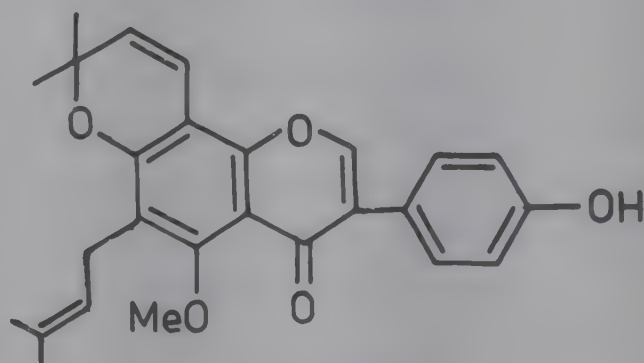
Lonchocarpic acid



Scandenin



Scandenone



Scandione

DESCURAINIA (Brassicaceae)

D. sophia (L.) Webb. ex Prantl syn. *Sisymbrium sophia* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 94).

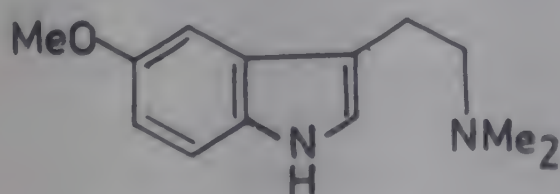
Seeds are expectorant, restorative, tonic and useful in fevers, bronchitis and dysentery; essential oil of seeds contains benzyl and allyl isothiocyanates and allyl disulphide (*Indian J. Appl. Chem.* 1959, 22, 122; *Chem. Abstr.* 1960, 54, 15840 i).

DESMODIUM (Papilionaceae)

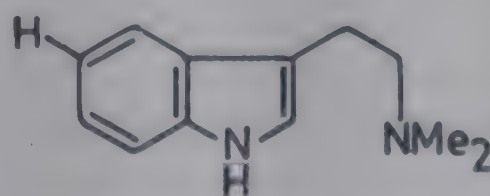
D. gangeticum (L.) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 94).

5-Methoxy-N,N-dimethyltryptamine, N,N-dimethyltryptamine, their N-oxides, N-methyl-tetrahydroharman, 6-methoxy-2-methyl- β -carbolinium cation (regenerated from Reinecke salt) from aerial parts (*Aust. J. Chem.* 1969, 22, 275).

NEW COMPOUNDS



5-Methoxy-N,N-dimethyltryptamine



N,N-Dimethyltryptamine

D. pulchellum (L.) Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1965, p. 94).

Total alkaloids (0.3%) of plant composed of bufotenine-O-methyl ether, mp. 69°, bufotenine, mp. 146°, N,N-dimethyltryptamine, mp. 47°, N,N-dimethyltryptamine oxide and two unidentified bases obtained as picrates, mp. 190° and mp. 268° (*Chem. Ind.* 1964, 1800); tryptamine bases - bufotenine, N,N-dimethyltryptamine, 5-methoxy-N,N-dimethyltryptamine and their N-oxides, 5-methoxy-N-methyltryptamine and gramine - isolated from whole plant (*Chem. Ind.* 1965, 793; *J. Org. Chem.* 1966, 31, 2284).

DICRANOSTIGMA (Papaveraceae)

D. lactucoides Hook.f. & Thoms. syn. *Tylophorum lactucoides* (Hook.f. & Thoms.) Benth. & Hook.f.

(+)Isocorydine, protopine, α -allocryptopine, chelerythrine, sanguinarine, chelirubine, coptisine, berberine and a new alkaloid, mp. 177°, isolated from aerial parts; besides these compounds, oxysanguinarine and corytuberine also isolated from roots (*Collect. Czech. Chem. Commun.* 1961, 26, 1839).

Distribution : Himalayas, Garhwal to Nepal, alt. 3500-4000 m.

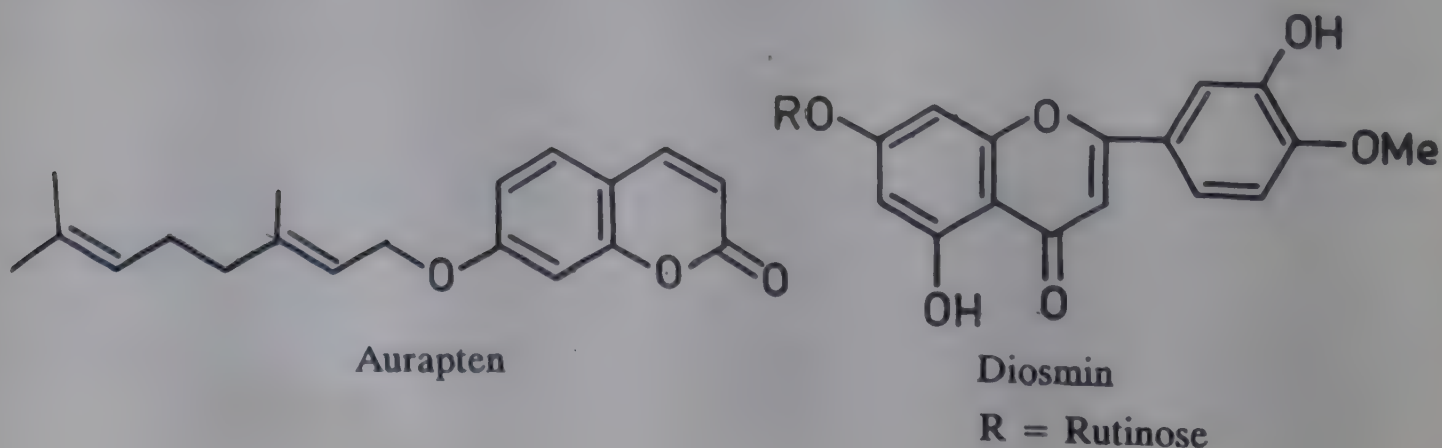
DICTAMNUS (Rutaceae)

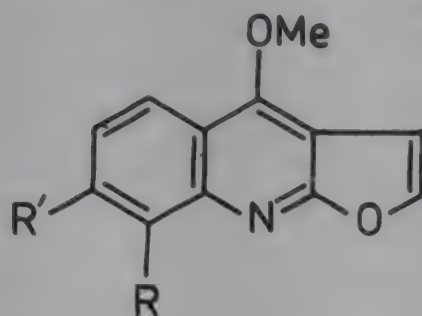
D. albus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 96).

Administration of plant extract in dogs (0.1-1.0 ml of 10% solution/kg) reduced blood coagulation time; maximum effect noted after 60 min (*Uch. Zap. Pyatigorskii Farmatsevt. Inst.* 1961, 5, 335; *Chem. Abstr.* 1964, 60, 4652 d).

Dictamnine and other alkaloids present in roots whereas leaves contained traces of dictamnine, skimmianine (β -fagarine) isolated (*Naturwiss.* 1961, 48, 53; *Chem. Abstr.* 1961, 55, 13776 f; *Acta Pol. Pharm.* 1961, 18, 97; *Chem. Abstr.* 1962, 56, 7424 a); bergapten, 5-methoxypsoralen (*Experientia* 1964, 20, 615); rutin and another flavonoid detected by PC in leaves diosmin, mp. 279°, isolated (*Diss. Pharm.* 1964, 16, 177; *Chem. Abstr.* 1965, 62, 817 f); γ -fagarine from roots (*Pharmazie* 1966, 21, 771; *Chem. Abstr.* 1967, 66, 108194 t); a coumarin - aurapten, mp. 66° - from plant (*Planta Med.* 1967, 15, 320).

NEW COMPOUNDS



 γ -Fagarine

R = OMe, R' = H

Dictamnine

R, R' = H

Skimmianine

R, R' = OMe

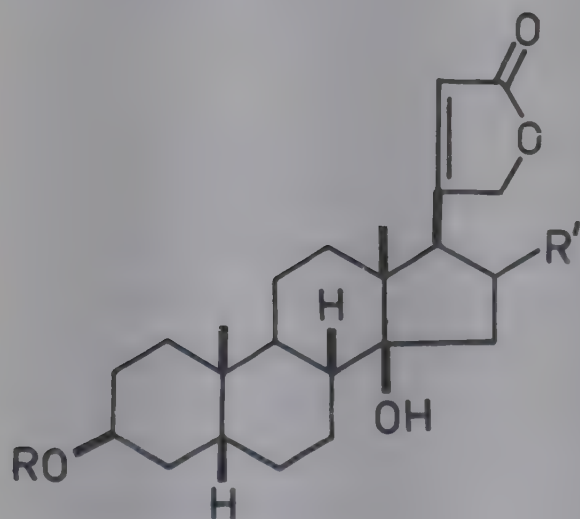
DIGITALIS (Scrophulariaceae)

D. lanata Ehrh. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 96).

Plant extract found to be more cardiotoxic than *D. purpurea* extracts at similar concentration (*Riv. Ital. Essenze-Profumi, Piante Offic., Aromi Saponi, Cosmet. Aerosol* 1967, 49, 531; *Chem. Abstr.* 1968, 68, 85820 u). Extract of leaves administered to castrated male rats in doses corresponding to 1 and 3 mg digitalin/kg for 10 days increased the weight of the musculus levator ani by 12.3 and 37.38% respectively and total body weight by 5.3 and 7.2% respectively as compared with nerobol, a preparation of known anabolic effect (*Izv. Inst. Fiziol., Bulg. Akad. Nauk.* 1968, 11, 179; *Chem. Abstr.* 1969, 70, 2269 p). Extraction of leaves with 20% alcohol gives digoxin due to hydrolysis of lanatoside C (*Aust. J. Pharm.* 1959, 40, 1067; *Chem. Abstr.* 1960, 54, 11385 f); eight glycosides - lanatosides A, B and C, stropeside, digitalin, verodoxin, gitoxin and acetyldigitoxin - separated by PC (*Istanbul Univ. Fen. Fak. Mecm. Ser. C* 1960, 25, 94; *Chem. Abstr.* 1962, 56, 2512 g); scutellarein, luteolin and a new pigment - dinatin (scutellarein monomethyl ether), mp. 274° - isolated from leaves (*Proc. Indian Acad. Sci.* 1961, 54A, 51); lanatoside complex content in plant was 0.227% (40% of total glycosides); it contained lanatosides A, B and C (49, 13 and 38% respectively); eighteen cardenolides identified by PC; acetyldigitoxin and digitoxin amounted to 0.0711 and 0.0126% respectively (*Acta Pol. Pharm.* 1961, 18, 303; *Chem. Abstr.* 1962, 56, 10279 g); hybrid of plant with *D. purpurea* contained mainly lanatoside A, with some lanatoside B but no lanatoside C; no *purpurea* glycoside A was present (*Pharmazie* 1961, 16, 475); lanatosides A, B, C, D and E, mp. 240°, obtained from plant (*Ger. (East)* 41,820 (1965), Nov. 15; *Chem. Abstr.* 1966, 64, 14036 a); a new glycoside - digitoxigenin glucosido-6-deoxy-glucoside - along with digoxin, gitoxin, digitoxigenin, gitaloxigenin, acetyldigitoxin lanadoxin acetylgitaloxin and acetylgitoxin isolated from leaves (*Naturwiss.* 1962, 49, 159; *Chem. Abstr.* 1962, 57, 16744 a); synthesis of digitoxigenin (*J. Am. Chem. Soc.* 1962, 84, 875); occurrence of 25 β -tigogenin, mp. 173°, 25 α -digalogenin, mp. 218°, and 25 α -gitogenin, mp. 244° in saponins of plant (*Tetrahedron* 1962,

18, 959); spirostanol saponins - lanatigonicin I, mp. 275°, lanadigalonicin I and lanadigalonicin II - from seeds (*Tetrahedron* 1963, 19, 2323); 5,7,4'-trihydroxy-3',6-dimethoxyflavone from leaves (*J. Chem. Soc.* 1963, 3780); tigogenin, digitoxigenin, 3-epidigitoxigenin, mp. 288°, digifolein, mp. 199°, from leaves (*Aust. J. Chem.* 1963, 16, 896); new glycosides - digoxoside, mp. 265°, neodigoxoside, mp. 235° and acetyl- γ -digoxin - isolated from leaves (*Naturwiss.* 1963, 50, 668; *Chem. Abstr.* 1964, 60, 5622 h); five primary glycosides - gluco-evatromonoside, mp. 263°, gluco-gitoroside monohydrate, mp. 237°, gluco-lanadoxin, mp. 166°, odorobioside G monohydrate, mp. 253° and gluco-verodoxin, mp. 179° - isolated from unfermented extract of leaves (*Ann. Chem.* 1964, 678, 137); acetyldigoxin, acetylgitoxin and acetyldigitoxin detected by PC in mother liquor after separation of lanatosides (*Acta Pol. Pharm.* 1964, 21, 519; *Chem. Abstr.* 1965, 62, 10292 f); new primary glycosides - neo-odorobioside G, mp. 272°, neo-digitalinum verum, mp. 220°, and digitoxigenin-O-glucosyl-6-deoxyglucoside, mp. 216° - from leaves (*Ann. Chem.* 1965, 688, 216); glucosides g7 and g8 identified as glucodigifucoside, mp. 184° and neoglucodigifucoside respectively (*Experientia* 1965, 21, 575); digitoxigenin- β -D-glucoside isolated from leaves (*Naturwiss.* 1965, 52, 108; *Chem. Abstr.* 1965, 62, 13515 g); 1-methoxy-2-methylanthraquinone, 3-methoxy-2-methylanthraquinone, digitolutein and 3-methylalizarin, mp. 250°, isolated from leaves (*Phytochemistry* 1968, 7, 1423).

NEW COMPOUNDS



Digitoxigenin

R, R' = H

Lanatoside A

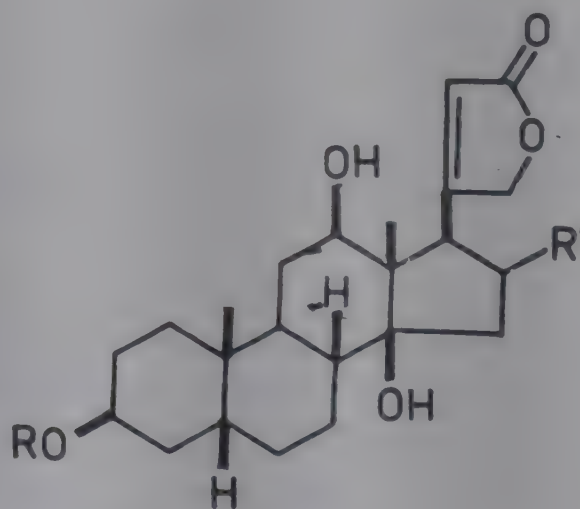
R = Digitoxose(4→1) digitoxose(4→1)
3-acetyldigitoxose(4→1)Glu, R' = H

Gitoxigenin

R = H, R' = β -OH

Lanatoside B

R = Digitoxose(4→1) digitoxose(4→1)
3-acetylgitoxose(4→1)Glu, R' = β -OH



Digoxigenin

R, R' = H

Lanatoside C

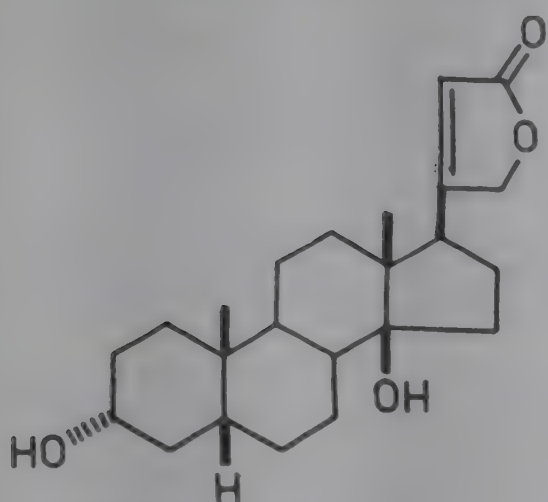
R = Digitoxose(4→1) digitoxose(4→1)
3-acetyldigitoxose(4→1)Glu, R' = H

Diginatigenin

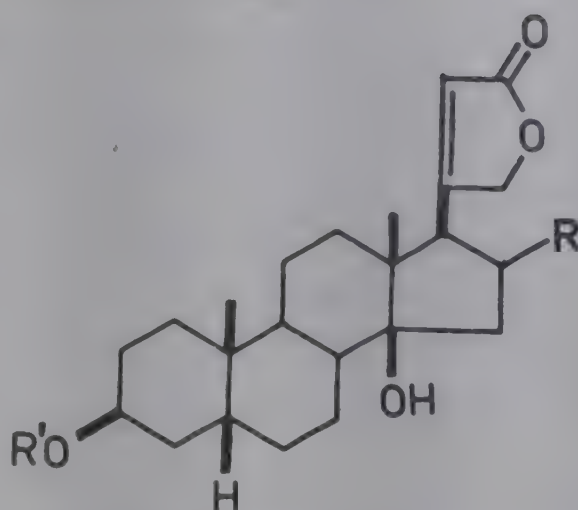
R = H, R' = β -OH

Lanatoside D

R = Digitoxose(4→1) digitoxose(4→1)
3-acetyldigitoxose(4→1)Glu, R' = β -OH



3-Epidigitoxigenin



Gluco-evatromonoside

$R = H, R' = \text{Digitoxose}(4 \rightarrow 1)\text{Glu}$

Gluco-gitoroside

$R = OH, R' = \text{Digitoxose}(4 \rightarrow 1)\text{Glu}$

Gluco-lanadoxin

$R = O-CHO, R' = \text{Digitoxose}(4 \rightarrow 1)\text{Glu}$

Odorobioside G

$R = H, R' = \text{Digitalose}(4 \rightarrow 1)\text{Glu}$

Gluco-verodoxin

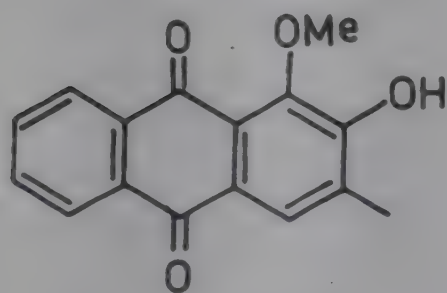
$R = O-CHO, R' = \text{Digitalose}(4 \rightarrow 1)\text{Glu}$

Neo-odorobioside G

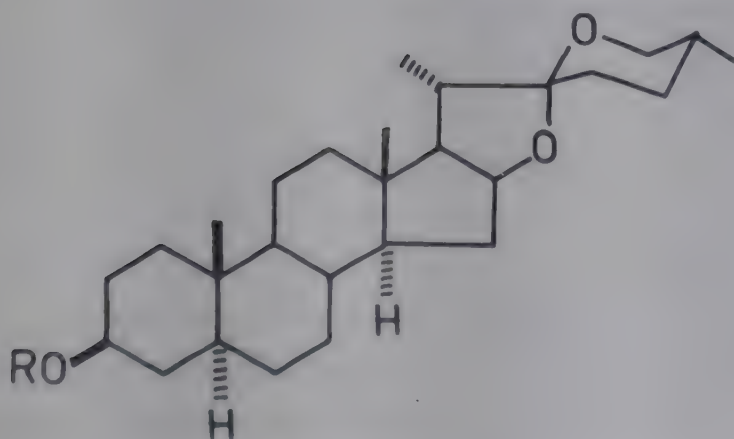
$R = H, R' = \text{Digitalose}(2 \rightarrow 1)\text{Glu}$

Neo-digitalinum verum

$R = OH, R' = \text{Digitalose}(2 \rightarrow 1)\text{Glu}$



Digitolutein



Lantigonin I

$R = \text{Gal}(3 \rightarrow 1)\text{Glu}[(2 \rightarrow 1)\text{Gal}(3 \rightarrow 1)\text{Glu}](3 \rightarrow 1)\text{Xyl}$

BIOLOGICAL ACTIVITY

Lethal doses of lanatoside, digitoxin, digitoxigenin, digoxin and digoxigenin in cat were found to be 1.16 ± 0.046 , 1.71 ± 0.066 , 0.60 ± 0.031 , 0.73 ± 0.019 and 0.70 ± 0.044 mg/kg, s.c.,

respectively. Relative inotropic molar potencies of digitoxin and digitoxigenin acetate were 4.1 and 0.43 respectively (compared with digitoxigenin), and those of digoxin and digoxigenin diacetate were 1.5 and 0.057 respectively (compared with digoxigenin) as measured in cat papillary muscle. Activity of derivatives of digitoxigenin and digoxigenin on isolated perfused guinea pig heart was determined by % increase in amplitude of contraction and mM producing cardiac arrest in 20-30 mins. The molar toxic activity of digitoxin was found to be 5.2 (compared with digitoxigenin as 1) and that of digoxin 10 (compared with digoxigenin as 1) (*British J. Pharmacol. Chemother.* 1962, 18, 311).

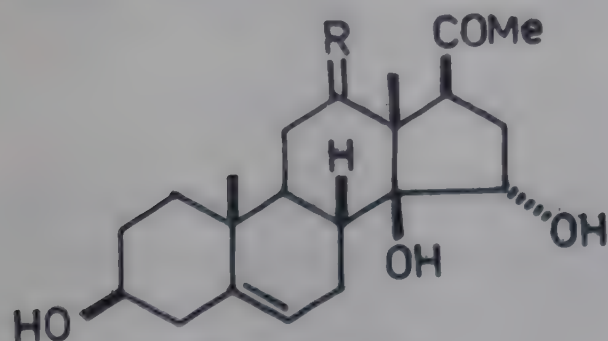
D. purpurea L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 97).

Extract of leaves injected into carotid artery of cat markedly increased action potentials of carotid sinus nerve which was followed by bradycardia (*Z. Biol.* 1958, 110, 316; *Chem. Abstr.* 1960, 54, 13408 i); i.v. infusion of aqueous purpurea extract (digitoxin content 86%) into mice gave LD50 as 26.4 γ /g (*Nippon Yakugaku Zasshi* 1960, 56, 259; *Chem. Abstr.* 1961, 55, 20203 h).

Gitoxin, gitoxin and digitoxin content of leaves from different sources (Ger. 1,042,838 (1958) Nov. 6; *Chem. Abstr.* 1961, 55, 912 f); gitostine, mp. 252° from seeds on hydrolysis gave gitoxigenin, glucose and digitalose (1:2:1) (Jpn. 5147 (1959) June, 19; *Chem. Abstr.* 1960, 54, 14308 h); new glycosides - A-VI, mp. 237° (0.0022), C-1', mp. 251° (0.0005), B-III, mp. 250° (0.0056), C-II, mp. 238° (0.0044), A-VII, mp. 242° (0.00005), A-VII', mp. 221° (0.00007), B-II, mp. 214° (0.005), B-III', mp. 240° (0.0015) and X-1, mp. 118° (0.025%) - from seeds; structure of C-II established as digitoxigenin- β -cellobiosido- β -D-fucoside (digifucocellobioside) and of B-III as digitoxigenin cellobiosido-tridigitoxoside (gitoxin cellobioside) (*Chem. Pharm. Bull.* 1959, 7, 212, 222, 226); deacylation studies on digitalinum verum hexa-acylates (*Chem. Pharm. Bull.* 1959, 7, 627); digitoxin (0.75), gitoxin (0.035), purpurea glycosides A and B (0.095%) from leaves (Jpn. 6744 (1959) Aug. 6; *Chem. Abstr.* 1960, 54, 1812 i); saponins (1%) from leaves yield tigogenin and gitogenin by micro-sublimation; two isomers of gitogenin were found by PC; tigogenin is main constituent in leaves whereas major constituent of seeds is digitonin (*Pharm. Zentralhalle* 1959, 98, 437; *Chem. Abstr.* 1960, 54, 819 e); hydrolysis of digipronin yields α -, β - and γ -digiprogenins; isodigipronin obtained by alkaline hydrolysis (*Yakugaku Zasshi* 1959, 79, 1475; *Chem. Abstr.* 1960, 54, 6809 g; *Chem. Pharm. Bull.* 1960, 8, 270); structure of purpnigenin, mp. 239°, (aglycone of purpnin) as 3 β ,14 β ,15 α -trihydroxypregn-5-en-20-one and chemical studies on purprogenin, mp. 249° (*Chem. Pharm. Bull.* 1960, 8, 657; *ibid.* 1961, 9, 411); structure of digitanidobiose, a disaccharide obtained by hydrolysis of lanatosides A,B,C and purpurea glycosides A and B (*Helv. Chim. Acta* 1961, 44, 238); a new isomeric glycoside - allodigitalinum verum - from seeds, characterised as 16 ξ ,17 α -gitoxigenin glucosidodigitaloside (*Chem. Pharm. Bull.* 1961, 9, 375); digacetigenin established as 3 β ,14 β -dihydroxy-12 β -acetoxy-15,20-oxo-5-pregnene (*Ann. Chem.* 1961, 642, 199; *J. Chem. Soc. C* 1968, 786); eleven new glycosides belonging to digitoxigenin and gitoxigenin series - substance B-O, substance PGA, mp. 248°, substance A-1, mp. 199°, substance A-II, substance

B-I, substance B-II, mp. 260°, PGB, mp. 228°, A-III, mp. 222°, A-IV, mp. 248°, C-O, mp. 240° and substance X-2 - from seeds (*Chem. Pharm. Bull.* 1961, 9, 276); substance C-O identified as odorobioside G; purlanosides A and B (isomers of lanatosides A and B) and deglucopurlanoside A isolated (*Chem. Pharm. Bull.* 1961, 9, 289); digipurpurogenin characterised as 3 β ,12 α ,14 α -trihydroxy-5-pregnen-20-one (*Ann. Chem.* 1961, 648, 185; *Tetrahedron Lett.* 1964, 473); a new glycoside - substance AX (alloneogitostin) - from seeds characterised as 16 ξ , 17 α -gitoxigenin- β -gentiobiosido- β -D-digitaloside (*Chem. Pharm. Bull.* 1961, 9, 519); structure elucidation of a new flavone - digicitrin, mp. 178° - from leaves (*Helv. Chim. Acta* 1962, 45, 232); previously reported digitanol glycosides - digipronin, mp. 235°, purpnin, mp. 282° and purpronin, mp. 278° - isolated from leaves; digipronin hydrolysate gave α -, β -, γ -digiprogenins and D-digitalose; hydrolysis of purpnin gave purpnigenin and digitoxose; configuration of digiprogenins (*Chem. Pharm. Bull.* 1962, 10, 37; *Chem. Pharm. Bull.* 1964, 12, 979); preparation of purpurea glycoside B, mp. 243°, from leaves (*Jpn.* 13,348 (1960), Feb. 3; *Chem. Abstr.* 1962, 56, 7400 c); cardenolide glycosides determined chromatographically in extract of leaves (*Acta Pol. Pharm.* 1963, 20, 109; *Chem. Abstr.* 1965, 62, 1513 c); saponins - degalactotigonin, mp. 284° and F-gitonin, mp. 252° - isolated from leaves and structure of F-gitonin as gitogenin-3 β -lycotetraoside established (*Brit.* 1,015,659 (1965) Jan. 5; *Chem. Abstr.* 1966, 64, 14260 d; *Tetrahedron* 1965, 21, 299); digitonin, mp. 244°, digaloinin, mp. 250° and deglucodigitonin isolated, molar ratio of their hydrolytic products (digitoxigenin, galactose, glucose, xylose) determined and structure of digitonin elucidated (*Tetrahedron* 1963, 19, 621); water-soluble glycoside - gitalin - found to be mixture of 3 glycosides (*Am. J. Pharm.* 1964, 136, 71); two saponins from seeds found to be mixtures, one composed of 3 tetraglycosides (deglucotigonin, gitonin and deglucodigitonin) while second contained two pentaglycosides (digaloinin and digitonin) (*Chem. Pharm. Bull.* 1964, 12, 1250); preparation of various cardiac glycosides from leaves (*Farmacia* 1964, 12, 529; *Chem. Abstr.* 1965, 62, 10292 b); digiprolactone, mp. 149°, isolated and found identical with lolilide reported from *Lolium perenne* (*Chem. Pharm. Bull.* 1965, 13, 43); 1-methoxy- and 3-methoxy-2-methylanthraquinones, digitolutein and 3-methylalizarin, mp. 250°, from leaves (*Phytochemistry* 1968, 7, 1423).

NEW COMPOUNDS

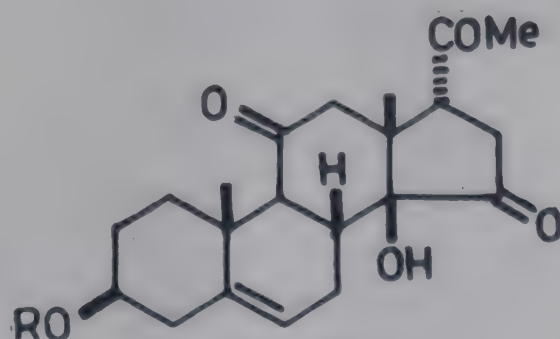


Purpnigenin

R = H,H

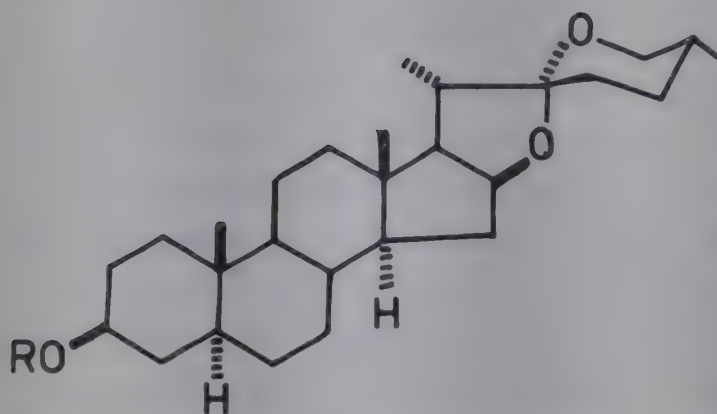
Purprogenin

R = O

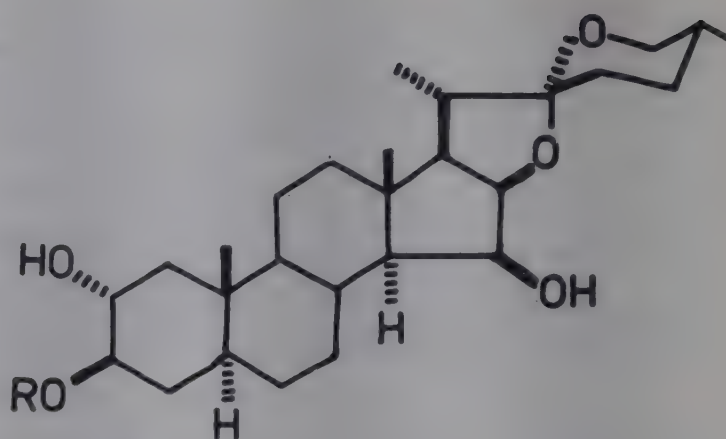


Digipronin

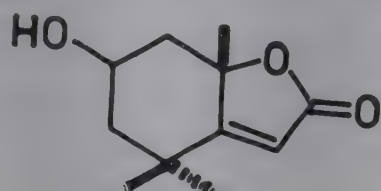
R = Digitalose



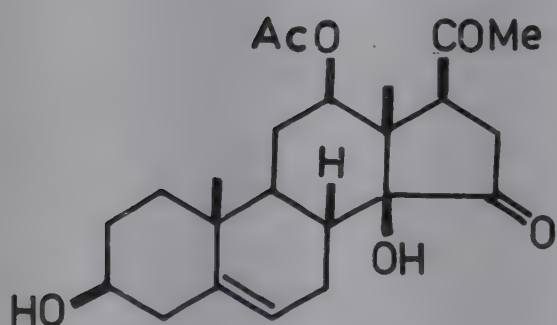
F-Gitonin

$$R = \text{Gal}(4 \rightarrow 1)\text{Glu}[(2 \rightarrow 1)\text{Glu}](3 \rightarrow 1)\text{Xyl}$$


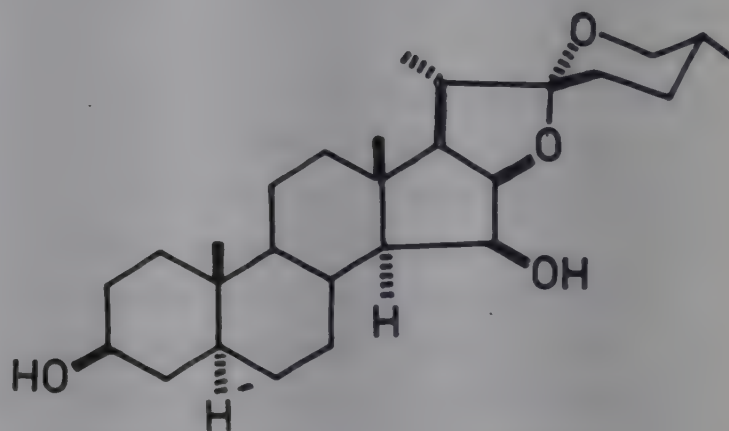
Digitonin

$$R = \text{Gal}(4 \rightarrow 1)\text{Glu}[(2 \rightarrow 1)\text{Gal}(3 \rightarrow 1)\text{Glu}](3 \rightarrow 1)\text{Xyl}$$


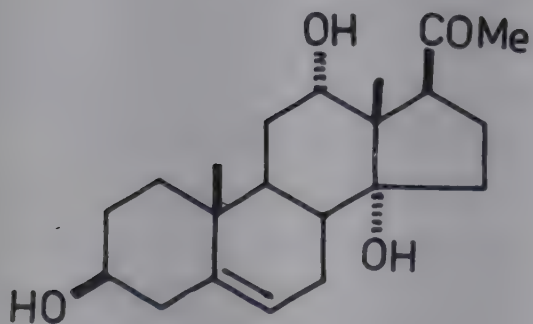
Digiprolactone



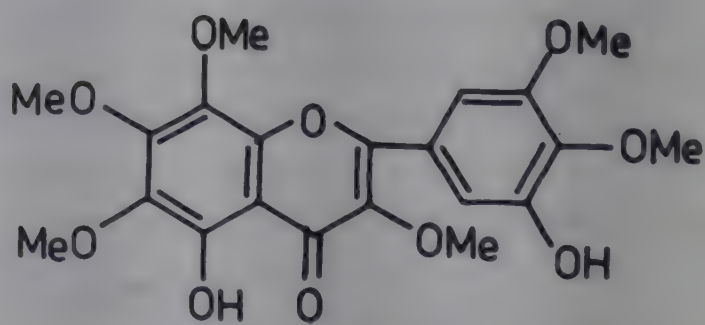
Digacetigenin



Digalogenin



Digipurpurogenin



Digicitrin

BIOLOGICAL ACTIVITY

K and Na concentrations in cardiac muscle of cat after application of aconitine and digitoxin studied. After application of aconitine 20.385 γ /kg to cats, there was a rise in intracellular K and Na concentrations in the heart. A nontoxic dose of digitoxin (0.3 mg/kg) resulted in increase of cardiac K (Z. *Gesamte Exp. Med.* 1957, 128, 329; *Chem. Abstr.* 1961, 55, 16808 h); noncardiotonic glucoside - digitonoside - increased oral and i.p. toxicity of cardiotonic glycoside mixture (digitoxin 20, gitoxin 12.5, gitaloxin 10, strospeptide 5 and verodoxin 2.5%) in mice. It increased toxicity of K-strophanthin when administered separately by venous route.

It showed haemolytic effect and its 100 to 200 mg/kg doses were nontoxic to mice and guinea pigs (*Therapie* 1959, 14, 290; *Chem. Abstr.* 1960, 54, 3745 f); activity of gitaloxin was compared with scillaren, strophanthin and digoxin in cardiac failure with reference to duration of action, level for full effect and maintenance level (*Klin. Wochschr.* 1959, 37, 196; *Chem. Abstr.* 1960, 54, 4905 f); relationship between chemical structure and toxicity of digitalium verum, digitoxin, strospeptide, purpurea glycoside B, 16-Ac derivative of digitalium verum, gitostin, neogitostin and glucodigifucoside studied. 16-Acetyl derivative of digitalium verum was about 5 times as lethal as digitalium verum (*Yakugaku Zasshi* 1960, 80, 465; *Chem. Abstr.* 1960, 54, 21488 b); plant contained a fast-acting component, strospeptide, and a slow-acting compound, glycoside B; when former injected consecutively at 2,5,10,20 and 40 minutes, the longer the interval of injection, the rise of lethal dose was rapid, whereas in case of slow-acting glycoside B and deacetyl lanatoside C, the lethal doses remained almost unchanged with associated bradycardia even if the interval of injection was increased (*Takamine Kenkyusho Nempo* 1961, 13, 88; *Chem. Abstr.* 1962, 56, 10279 c); in vitro assay showed that digitoxin, lanatosides A and C and strophanthoside augment the response of isolated guinea pig uterus to oxytocin (*Arch. Ital. Sci. Farmacol.* 1961, 11, 187; *Chem. Abstr.* 1962, 57, 11795 h); digitalin, navelle, ouabain and k-strophanthoside at concentration of 0.4-20 ppm induced contraction of perfused guinea pig ileum, followed by relaxation. Addition of acetylcholine or histamine during contraction period potentiated contraction response, but during the relaxation period this response was inhibited (*Arch. Int. Pharmacodyn. Ther.* 1961, 130, 435; *Chem. Abstr.* 1961, 55, 16802 i); visnadin increased survival in animals poisoned by acute or chronic administration of digitoxin, prevented bradycardia and reversed cardiac arrhythmia (*J. Pharm. Sci.* 1962, 51, 1013); after injection of strophanthin (1 mg/kg) in mice, 30 min. prior to injection of glucose-14C, level of 14C in all parts of brain increased significantly, but did not do so with same dose of digoxin (*Klin. Wochschr.* 1962, 40, 1077; *Chem. Abstr.* 1963, 58, 3804 g); addition of digitoxigenin 1 µg/ml to a nutrient solution containing 53.6 meq. Ca/l increased the heart contraction amplitude of sacrificed guinea pig (*Arch. Exp. Pathol. Pharmacol.* 1963, 244, 531; *Chem. Abstr.* 1963, 59, 9214 g).

DILLENIA (Dilleniaceae)

D. indica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 97).

Betulinic acid and betulin from trunk bark (*J. Indian Chem. Soc.* 1962, 39, 276).

DIOSCOREA (Dioscoreaceae)

D. alata L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 97).

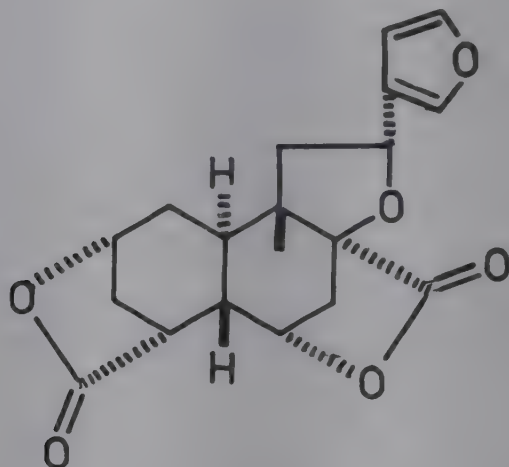
Three acylated anthocyanins from tubers, the chief pigment being cyanidin-3-gentiobioside ferulate (*Experientia* 1968, 24, 445).

D. bulbifera L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956,

p. 97).

Three new furanoid norditerpenes - diosbulbins A, mp. 265°, B, mp. 285° and C, mp. 247° - from root tubers (*Chem. Pharm. Bull.* 1968, 16, 2430; *Indian J. Chem.* 1969, 7, 452).

NEW COMPOUNDS



Diosbulbin B

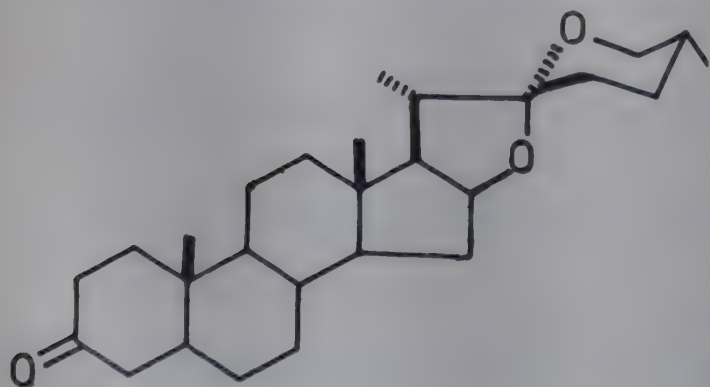
BIOLOGICAL ACTIVITY

Acetone extract of rhizomes administered i.p. (10-45 mg/kg) 30 min. before food presentation, inhibited food intake during 90 and 300 min. in rats. Results compared with data obtained with cocaine HCl (6.0-9.0 mg/kg) and methylphenidate HCl (1.8 mg/kg) (*Indian J. Med. Res.* 1969, 57, 1075).

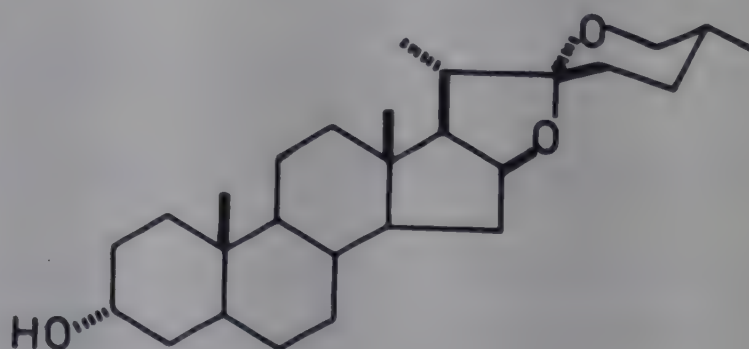
D. deltoidea Wall. ex Kunth (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 97).

Distribution of diosgenin in different parts of plant (*Ann. Appl. Biol.* 1966, 58, 203; *Chem. Abstr.* 1967, 66, 52912 f); smilagenone, mp. 188° and epismilagenin, mp. 220°, from yams (*J. Indian Chem. Soc.* 1961, 38, 635); method for isolation of diosgenin (*Bull. Calcutta Sch. Trop. Med.* 1959, 7, 5; *Chem. Abstr.* 1960, 54, 14301 h).

NEW COMPOUNDS



Smilagenone



Epismilagenin

D. prazeri Prain & Burkill (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 98).

Steroid sapogenins - smilagenone and epismilagenin - isolated from yams (*J. Indian Chem. Soc.* 1961, 38, 635); preparation of diosgenin (*Bull. Calcutta Sch. Trop. Med.* 1959, 7, 5; *Chem.*

Abstr. 1960, 54, 14301 h).

DIOSPYROS (Ebenaceae)

D. chloroxylon Roxb.

Mar. - Ninai, Nensi; Tel. - Illinda; Tam. - Karuvakkanai; Uriya - Ondodi.

Lupeol, betulin, betulinic acid, β -sitosterol isolated from fruits (*Curr. Sci.* 1964, 33, 367).

Distribution : Central and southern India extending north to Orissa, Chanda and Nasik.

D. discolor Willd.

H. - Bilayati gab.

Betulin, betulinic acid and β -sitosterol from fruits and wood (*Curr. Sci.* 1964, 33, 367).

Distribution : Native of Phillippines, introduced into India in southern part of peninsula and in Bihar and Assam.

D. ebenum Koen. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 98).

α -Amyrenone from heartwood (*Indian J. Pharm.* 1967, 29, 289); α -amyrin, betulin, lupeol, ursolic acid from leaves (*Indian J. Pharm.* 1968, 30, 93).

D. embryopteris Pers.; see *D. malabarica* (Desr.) Kostel.

D. kaki L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 98).

Cryptoxanthin, phytoene, phytofluene, α -, β -, δ - and γ - carotenes, lycopene, zeaxanthin, antheraxanthin, violaxanthin and lutein (*C.R. Acad. Agr. Fr.* 1961, 47, 336; *Chem. Abstr.* 1965, 62, 8113 a); β -sitosterol from wood (*Curr. Sci.* 1964, 33, 367).

D. malabarica (Desr.) Kostel. syn. *D. peregrina* Gurke, *D. embryopteris* Pers. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 99).

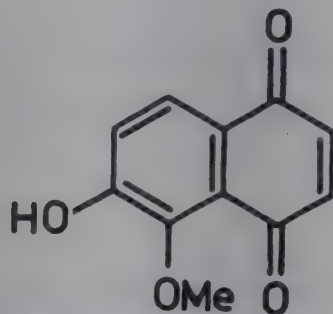
β -Sitosterol, betulin, oleanolic acid and myricyl alcohol from leaves; saponin from bark (*Indian J. Chem.* 1964, 2, 129; *Proc. Nat. Acad. Sci. India* 1964, 34A, 180; *Chem. Abstr.* 1965, 62, 9462 h); betulinic acid from bark, betulin from leaves (*Curr. Sci.* 1964, 33, 367).

D. melanoxylon Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 98).

Ceryl alcohol, lupeol, betulin, β -sitosterol, sequoyitol and a new triterpene carboxylic acid - diospyric acid, mp. 272° - from bark and leaves (*Proc. Indian Acad. Sci.* 1964, 60A, 36; *Chem. Abstr.* 1964, 61, 16442 d; *Curr. Sci.* 1964, 33, 367); new naphthoquinone - diomelquinone A - isolated from heartwood and structure determined (*Ann. Chem.* 1966, 691, 172; *Chem. Abstr.* 1966, 64, 14142 g); 7-methyljuglone and some other naphthoquinones from bark and sapwood (*Bull. Nat. Inst. Sci. India* No. 28, 1965, 69; *Chem. Abstr.* 1967, 66, 26564 z); lupeol, betulin, diospyric acid, mixture of betulinic, oleanolic and ursolic acids and bauerenol, mp. 212°, from leaves (*Curr. Sci.* 1966, 35, 457, 458; *Indian J. Chem.* 1969, 7, 204); 2-methyl-5-

methoxy-1,4-naphthoquinone, 3-methyl-8-methoxy-1, 2-naphthoquinone, 2-methyl-3-hydroxy-5-methoxynaphthoquinone and 2-methyl-5,6-dimethoxy-1, 4-naphthoquinone from heartwood (*Indian J. Chem.* 1968, 6, 681).

NEW COMPOUNDS



Diomelquinone A

D. montana Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 99).

A new pigment - diospyrin, mp. 258° - lupeol, betulin and betulinic acid from stem bark (*J. Sci. Ind. Res.* 1961, 20B, 498).

D. peregrina Gurke; see *D. malabarica* (Desr.) Kostel.

D. sylvatica Roxb.

Oriya - Khaliya; Tel. - Gadalu; Kan. - Bilisalari.

Lupeol, betulin and betulinic acid from bark (*Curr. Sci.* 1966, 35, 458); α -amyrin, bauerenol and a new triterpene alcohol from leaves (*Curr. Sci.* 1968, 37, 104).

Distribution : Orissa and south India.

DODONAEA (Sapindaceae)

D. viscosa (L.) Jacq. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 100).

Plant extract exhibited cardioinhibitory and coronary constricting properties and spasmolytic activity on smooth muscles and intestine. It also had sedative effect on virgin guinea pig uterus and hypotensive effect unaffected by atropine (*J. Sci. Ind. Res.* 1962, 21B, 249).

β -Sitosterol, stigmasterol and isorhamnetin, mp. 302°, (*J. Indian Chem. Soc.* 1962, 39, 561); a leucocyanidin from bark (*Leather Sci.* 1966, 13, 174; *Chem. Abstr.* 1966, 65, 14096 g).

DOLICHOS (Papilionaceae)

D. biflorus L.; see *D. uniflorus* Lamk.

D. lablab L.; see *Lablab purpureus* (L.) Sweet

D. uniflorus Lamk. syn. *D. biflorus* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 100).

Seed extractive showed marked hypoglycaemic and hypocholesterolaemic effects in normal

rats (*Indian J. Med. Res.* 1968, 56, 1808).

DOXANTHA (Bignoniaceae)

D. unguis-cati (L.) Rehd.

Cis-9-hexadecenoic (64.O), cis-11-octadecenoic (15.O), oleic (4.O), hexadecadienoic (1.O), linoleic (4.O), palmitic (12.O) and stearic acids (1.O%) from seed oil (*J. Am. Oil Chemists Soc.* 1965, 42, 49; *Chem. Abstr.* 1965, 62, 6691 a).

Distribution : Tropical American plant, grown in Indian gardens.

DRACOCEPHALUM (Lamiaceae)

D. moldavicum L. (moldavica) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 101).

Presence of four flavonoid compounds including a new glycoside - moldavoside - by PC (*Farm. Zh.* 1968, 23, 75; *Chem. Abstr.* 1968, 69, 44172 m).

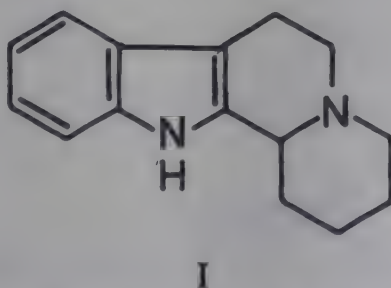
DRACONTOMELON (DRACONTOMELUM) (Anacardiaceae)

D. dao (Blanco) Merr. & Rolfe syn. *D. mangiferum* Blume.

Major alkaloid (I) identified as (-)-1,2,3,4,6,7-hexahydro-12H-indolo-(2,3-a)quinolizine (*Aust. J. Chem.* 1966, 19, 1951).

Distribution : Andaman Islands.

NEW COMPOUNDS



D. mangiferum Blume.; see *D. dao* (Blanco) Merr. & Rolfe

DREGEA (Asclepiadaceae)

D. volubilis (L.f.) Benth. ex Hook.f.; see *Wattakaka volubilis* (L.f.) Stapf

DROSERA (Droseraceae)

D. lunata Buch.-Ham.; see *D. peltata* Sm.

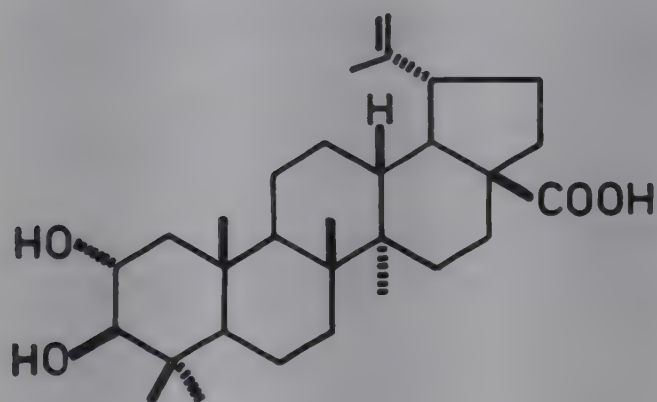
D. peltata Sm. syn. *D. lunata* Buch.-Ham. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 102).

A material from extract of leaves and stems, believed to be a mixture of hydroxynaphthoquinone and its derivatives, inhibited growth of *Mycobacterium tuberculosis*, *Proteus vulgaris*, *Bacillus subtilis*, *Escherichia coli* and *Staphylococcus aureus* (*Jpn.* 9496 (1958) Oct. 25; *Chem. Abstr.* 1960, 54, 6043 a).

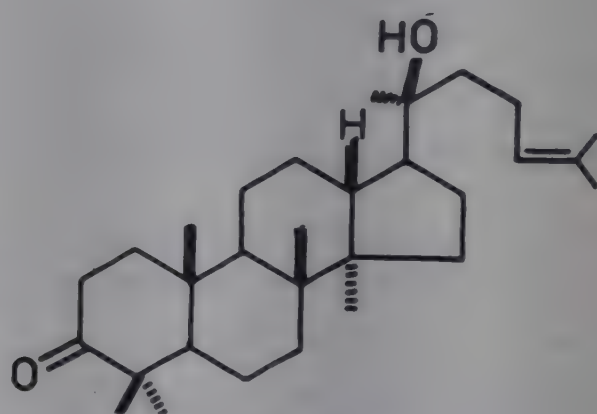
DRYOBALANOPS (Dipterocarpaceae)

D. aromatica Gaertn. f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 102).

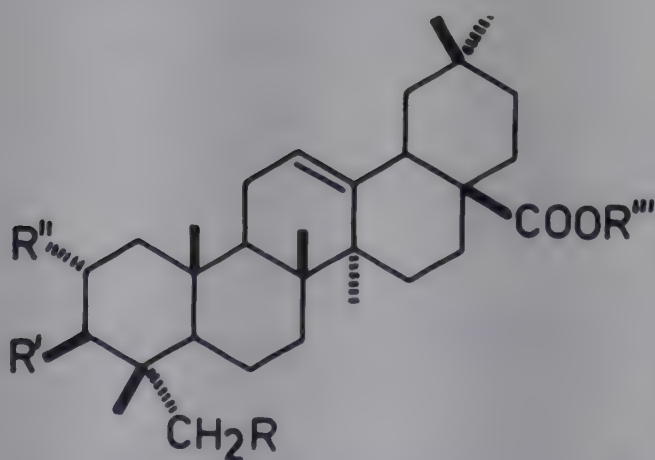
Caryophyllene, humulene, several triterpenes, chiefly dipterocarpol and a new triterpene - dryobalanone, mp. 80° - from resin (*Tetrahedron Lett.* 1967, 2807); oleanonic, oleanolic, maslinic, arjunolic, asiatic and alphitolic acids along with hederagenin from resin (*J. Chem. Soc. C* 1968, 1047); purification of crude Me asiataate from resin via 3,23-O-isopropylidene derivative which on chromatography yielded Me 3,23-O-isopropylidene-asiataate; a α,β -unsaturated ketone and a γ -lactone (*Tetrahedron Lett.* 1968, 4363); structure elucidation of dryobalanone (*J. Chem. Soc. C* 1968, 2686).

NEW COMPOUNDS

Alphitolic acid



Dryobalanone



Arjunolic acid

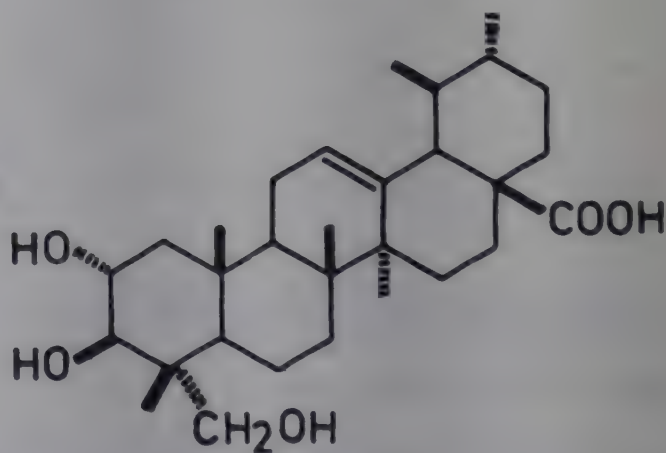
$R, R', R'' = \text{OH}, R''' = \text{H}$

Hederagenin

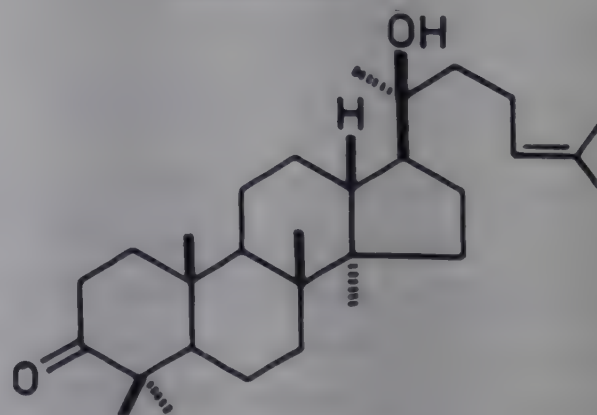
$R, R' = \text{OH}, R'', R''' = \text{H}$

Maslinic acid

$R, R''' = \text{H}, R', R'' = \text{OH}$



Asiatic acid

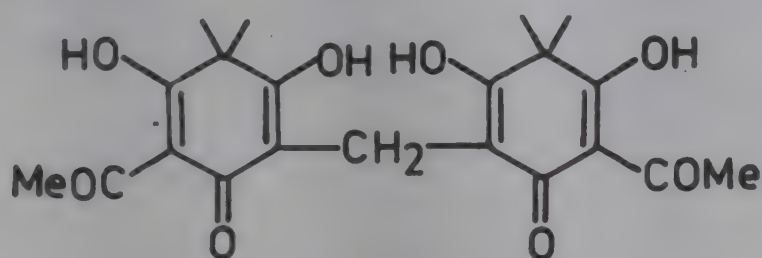


Dipterocarpol

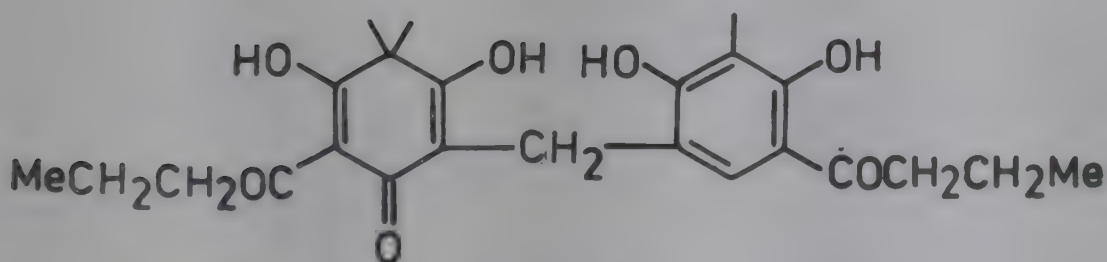
DRYOPTERIS (Dryopteridaceae)

D. filix-max (L.) Schott. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 102).

Filicin, mp. 92° , α -flavaspidic acid, mp. 93° , albaspidin, mp. 145° and filixic acid, mp. 168° , from rhizomes (*Ann. Univ. Mariae Curie-Sklodowska, Lublin-Polonia* 1959, 14D, 291; *Chem. Abstr.* 1961, 55, 10808 f); synthesis of filicinic acid (*Ann. Chem.* 1962, 656, 127); five acids identified in fronds - hexadeca-7,10,13-trienoic, octadeca-9,12,15-trienoic, eicosa-8,11,14-trienoic, eicosa-5,8,11,14-tetraenoic and eicosa-5,8,11,14,17-pentaenoic acids (*Phytochemistry* 1967, 6, 399).

NEW COMPOUNDS

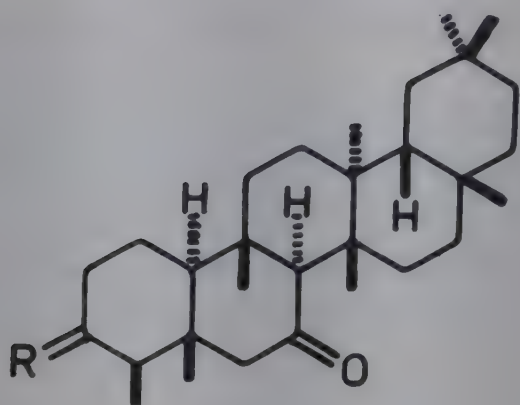
Albaspidin

 α -Flavaspidic acid**DRYPETES** (Euphorbiaceae)

D. roxburghii (Wall.) Hurus syn. *Putranjiva roxburghii* Wall. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 207).

Isolation and characterisation of new triterpenes - putranjivadiene and roxburgholone - from bark; characterisation of former as friedelan-3,7-dione and latter as 3α -hydroxyfriedelan-7-one (*Tetrahedron* 1968, 24, 1205, 6259); a saponin - putranjivoside, mp. 215° - from seed coat, characterised as 3β -L-arabino-L-rhamno-D-glucoside of oleanolic acid (*Planta Med.* 1968, 16, 17); two new triterpenoids - putranjivanonol (roxburgholone) and putranjic acid, mp. 220° - from stem bark; structure of putranjic acid determined (*Phytochemistry* 1968, 7, 2053; *Tetrahedron Lett.* 1969, 231); putrolic acid from stem bark identified as putranjic acid (*Curr. Sci.* 1969, 38, 101); new triterpenes - putrone, putrol, putranjivic acid - besides β -amyrin, its palmitate and stigmasterol isolated from leaves; structure of putranjivic acid elucidated (*Curr. Sci.* 1968, 37, 301); putranjivic acid characterised as 3,4-sec-friedelan-4(23)-en-3-oic acid (*Indian J. Chem.* 1969, 7, 1179).

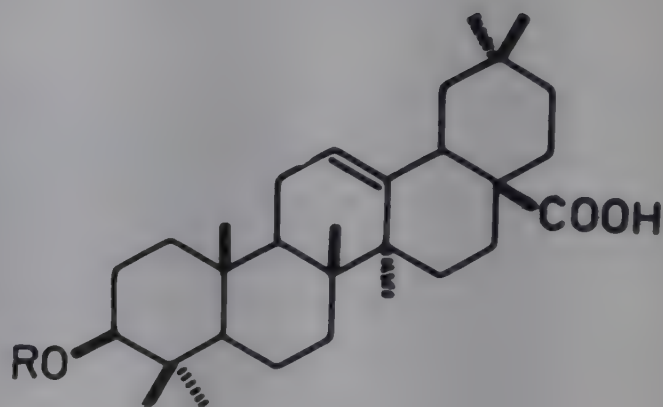
NEW COMPOUNDS



Putranjivadione

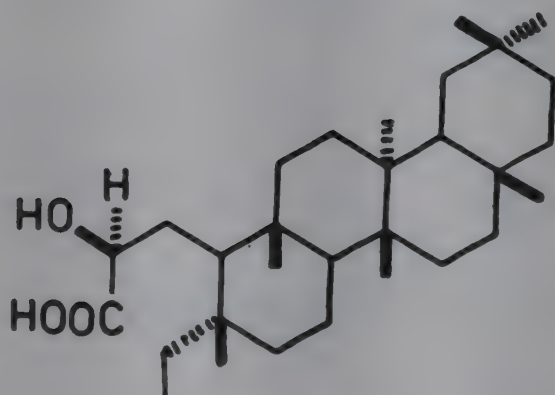
R = O

Roxburgholone

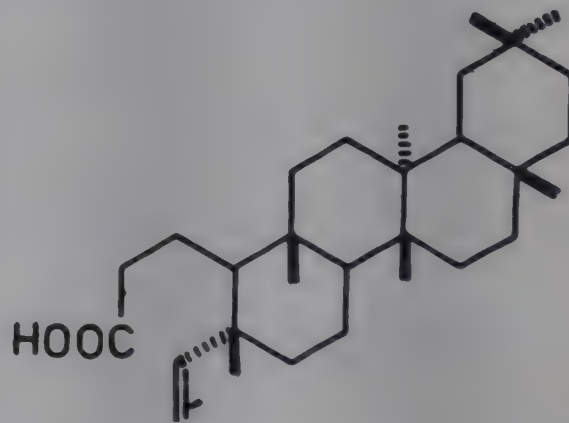
R = H, α -OH

Putranjivoside

R = Glu-Rha-Ara



Putranjic acid



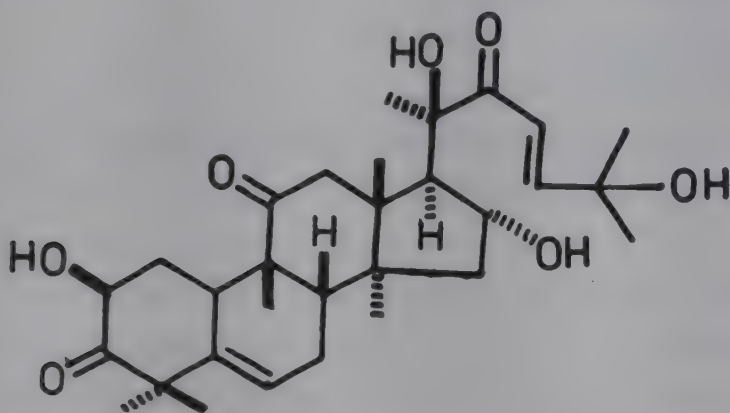
Putranjivic acid

DURANTA (Verbenaceae)*D. plumieri* Jacq.; see *D. repens* L.*D. repens* L. syn. *D. plumieri* Jacq. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 103). β -Sitosterol and ursolic acid from plant (*J. Indian Chem. Soc.* 1960, 37, 697).**ECBALLIUM** (Cucurbitaceae)*E. elaterium* A. Rich. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 103).

Structures of elatericin A (cucurbitacin D), elatericin B (cucurbitacin I), α -elaterin (cucurbitacin E), related cucurbitacins and their degradation products established (*Chem. Ind.* 1960, 403; *J. Am. Chem. Soc.* 1960, 82, 966, 1668; *Tetrahedron Lett.* 1961, 615; *J. Org. Chem.* 1962, 27, 4546); separation of free cucurbitacins C, D, E, H, I and G from roots, leaves and fruits (*An. Real Soc. Esp. Fis. Quim. Ser. B* 1967, 63, 959; *Chem. Abstr.* 1968, 68, 6124 u); two acids, $C_4H_7O_4-C(OMe)_2COOH$, mp. 91° , and $C_7H_9O_3C(OMe)_2COOH$, mp. 126° , along with

succinic, oleic, linoleic, linolenic, palmitic, stearic and myristic acids from roots (*Sci. Pharm.* 1963, 31, 241; *Chem. Abstr.* 1964, 60, 6701 a); alkaline degradation products of elaterin characterised (*J. Chem. Soc.* 1964, 3543); structure of a new sterol - elasterol, mp. 167° - from roots and leaves, proposed (*An. Real Soc. Esp. Fis. Quim. Ser. B* 1967, 63, 1123; *Chem. Abstr.* 1968, 68, 78485 k).

NEW COMPOUNDS



Elatericin A

ECHINOPS (Asteraceae)

E. echinatus Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 104).

Isolation of β -amyrin and lupeol (*J. Indian Chem. Soc.* 1968, 45, 697).

EICHHORNIA (Pontederiaceae)

E. crassipes (Mart.) Solms (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 104).

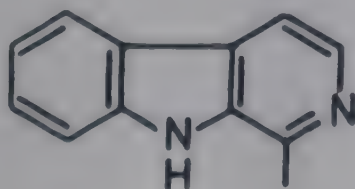
A new anthocyanin - eichhornin - isolated from flowers, characterised as delphinidin-3-diglucoside (*Bot. Mag.* 1965, 78, 299; *Chem. Abstr.* 1966, 65, 1035 b).

ELAEAGNUS (Elaeagnaceae)

E. angustifolia L. syn *E. hortensis* M. Bieb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 104).

Carboline alkaloids - tetrahydroharman and harman - identified in aerial parts (*Herba Pol.* 1967, 13, 103; *Chem. Abstr.* 1968, 68, 112163 r).

NEW COMPOUNDS



Harman

E. hortensis M. Bieb.; see *E. angustifolia* L.

ELEPHANTOPUS (Asteraceae)

E. scaber L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 105).

Epifriedelinol, lupeol, stigmasterol and a mixture of triacontan-1-ol and dotriacontan-1-ol isolated (*Phytochemistry* 1969, 8, 933).

ELETTARIA (Zingiberaceae)

E. cardamomum (L.) Maton (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 106).

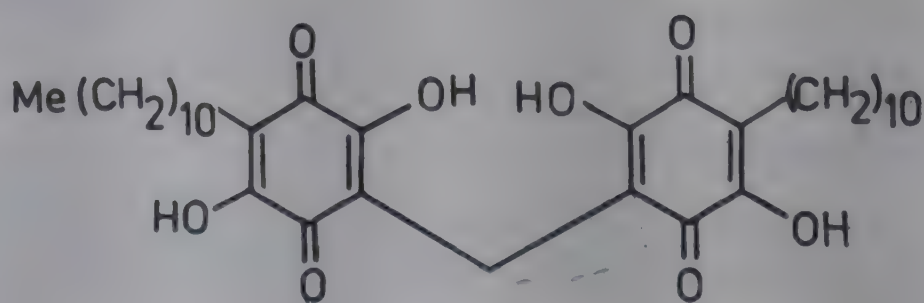
Presence of α -pinene (1.9), sabinene (4.5), myrcene (0.2), limonene (14.3), cineol (30.7), cymene (1.9), Me heptenone (0.8), linalool (0.9), linalyl acetate (1.2), β -terpineol (0.8), α -terpineol (3.7), α -terpinyl acetate (28.1), borneol (0.1), neryl acetate (0.3), geraniol (0.7), nerol (1.4), neolidol (0.3), heptacosane (0.5) and unidentified compounds (9.7%) in essential oil detected by GC (*J. Pharm. Sci.* 1965, 54, 799).

EMBELIA (Myrsinaceae)

E. ribes Burm.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 106).

A new compound - vilangin (0.06%), mp. 264°, identified as methylenebis-(2,5-dihydroxy-4-undecyl-3,6-benzoquinone) - isolated from berries (*Curr. Sci.* 1961, 30, 259); isolation, structure and synthesis of vilangin (*J. Org. Chem.* 1961, 26, 4529; *Bull. Nat. Inst. Sci. India*. No. 28, 1966, 14; *Chem. Abstr.* 1967, 66, 28481 u).

NEW COMPOUNDS



Vilangin

E. robusta Roxb.; see *E. tsjeriam-cottam* A. DC.

E. tsjeriam-cottam A. DC. syn. *E. robusta* Clarke (non Roxb.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 106).

Isolation of vilangin from plant and ripe berries (*Curr. Sci.* 1961, 30, 259; *Bull. Nat. Inst. Sci. India* No. 28, 1966, 14; *Chem. Abstr.* 1967, 66, 28481 u).

EMBLICA (Euphorbiaceae)

E. officinalis Gaertn. syn. *Phyllanthus emblica* L. (*Glossary Indian Med. Plants*, Chopra, Nayar

& Chopra, PID, New Delhi, 1956, p. 106).

Trigalloylglucose, terchebin, corilagin, ellagic acid from fruits (*Leather Sci.* 1968, 15, 337; *Chem. Abstr.* 1969, 71, 10285 b); preparation of phyllembic acid salts and structure studies (*Bull. Res. Inst. Univ. Kerala* 1959, 6, 21; *Chem. Abstr.* 1960, 54, 16746 e).

BIOLOGICAL ACTIVITY

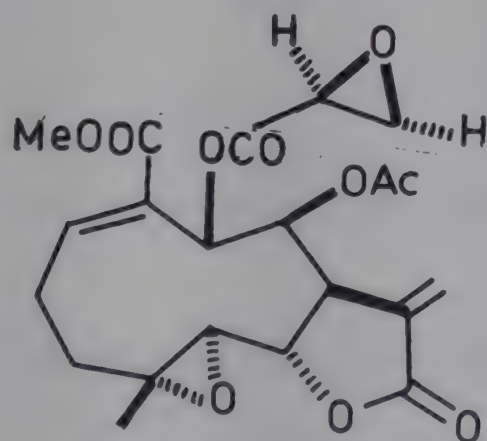
Preliminary pharmacological studies on phyllembic acid, chief constituent of fruit, reported. Rabbits tolerated a dose of 150 mg/kg administered i.v. or orally. Blood pressure and respiration of anaesthetised dogs not affected by i.v. administration of 100 mg/kg of phyllembic acid. There was no effect on isolated intestine of rabbits and uterus of guinea pigs and rats. A neutral solution of phyllembic acid did not show in vitro antibacterial activity in concentration upto 1.0 mg/ml (*J. Sci. Ind. Res.* 1959, 18C, 180).

ENHYDRA (Asteraceae)

E. fluctuans Lour. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 107).

Isolation and structure of a sesquiterpene lactone - enhydrin (*Curr. Sci.* 1968, 37, 94; *ibid.* 1969, 38, 284; *J. Sci. Ind. Res.* 1976, 35, 239).

NEW COMPOUNDS



Enhydrin

ENICOSTEMMA (Gentianaceae)

E. hyssopifolium (Willd.) Verdoon syn. *E. littorale* Blume (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 107).

Isolation of swertiamarin (*Curr. Sci.* 1966, 35, 148).

E. littorale Blume; see *E. hyssopifolium* (Willd.) Verdoon

ENSETE (Musaceae)

E. superbum (Roxb.) Cheesman syn. *Musa superba* Roxb.

Mar. - Chowani

Three constituents isolated from seeds inhibited growth of vaccinia and variola viruses on chick chorioallantoic membrane. LD50 of one of them was 174 mg/kg, i.p., while the other

two were nontoxic to mice. They may be useful in the treatment of smallpox (*Indian J. Med. Res.* 1968, 56, 735).

Distribution : Western Ghats from Bombay to Travancore hills and ravine slopes and Assam.

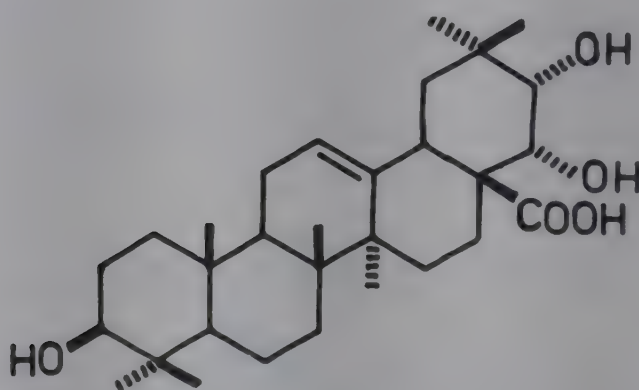
ENTADA (Mimosaceae)

E. phaseoloides Merr.; see *E. pursaetha* DC. ssp. *pursaetha*

E. pursaetha DC. ssp. *pursaetha* syn. *E. phaseoloides* Merr.; *E. scandens* auct. (non L.) Benth p.p. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 107).

Structure of entagenic acid isolated from kernels elucidated as $3\beta,21\alpha,22\alpha$ -trihydroxyolean-12-en-28-oic acid (*Tetrahedron* 1967, 23, 1499, 1505).

NEW COMPOUNDS



Entagenic acid

E. scandens Benth.; see *E. pursaetha* DC. ssp. *pursaetha*

EQUISETUM (Equisetaceae)

E. arvense L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 108).

Oil exhibited antibacterial activity against *Staphylococcus aureus*, *S. pyogenes* and mycobacteria (*Farmacia* 1962, 10, 535; *Chem. Abstr.* 1965, 62, 13513 b).

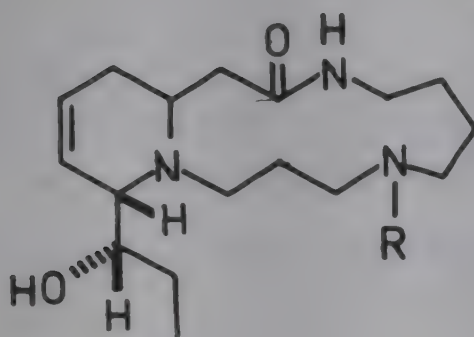
β -Sitosterol isolated (*Rocz. Chem.* 1963, 37, 575).

E. palustre L.

Chemical studies on palustrine and isolation of palustridine (*Helv. Chim. Acta* 1953, 36, 1387); structure of palustrine elucidated (*Chimia* 1960, 14, 353; *Chem. Abstr.* 1961, 55, 12438 d; *Helv. Chim. Acta* 1969, 52, 673); structure of palustridine (*Helv. Chim. Acta* 1969, 52, 673).

Distribution : Kashmir.

NEW COMPOUNDS



Palustridine

R = CHO

Palustrine

R = H

ERIGERON (Asteraceae)

E. canadensis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 109).

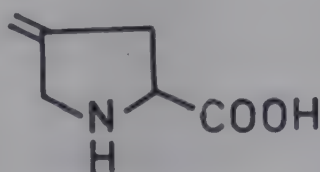
Essential oil (0.36%) contained limonene, linalool, linoleyl acetate and aldehyde (6%) (*Zh. Prikl. Khim.* 1960, 33, 444, *Chem. Abstr.* 1960, 54, 11386 f).

ERIOBOTRYA (Rosaceae)

E. japonica (Thunb.) Lindl. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 109).

A new proline derivative - 4-methyleneproline, mp. 225° - from seeds (*Nature* 1962, 193, 1285).

NEW COMPOUNDS



4-Methyleneproline

ERUCA (Brassicaceae)

E. sativa Mill. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 110).

3'-Methoxy-4',5,7-trihydroxyflavonol (isorhamnetin) and its 3-glucoside identified in leaves (*J. Indian Chem. Soc.* 1969, 46, 286).

ERVATAMIA (Apocynaceae)

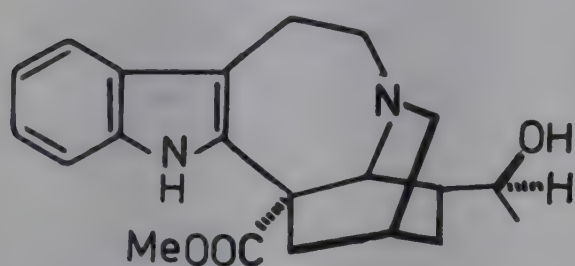
E. coronaria Stapf; see *Tabernaemontana divaricata* (L.) R.Br. ex R. & S.

E. dichotoma (Roxb.) Blatter syn. *Tabernaemontana dichotoma* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 110).

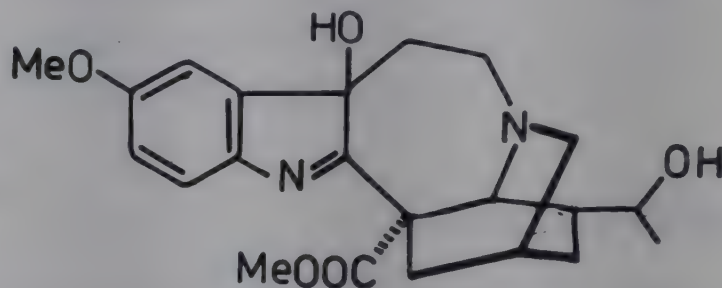
An alkaloid - heyneanine, mp. 160° - from root bark; its structure established as 20-hydroxycoronaridine (*Tetrahedron Lett.* 1961, 1251; *ibid.* 1972, 2763); voacristine hydroxyindolenine from root bark (*J. Org. Chem.* 1968, 33, 1225).

E. divaricata (L.) Alston; see *Tabernaemontana divaricata* (L.) R.Br. ex R. & S.

NEW COMPOUNDS



Heyneanine



Voacristine hydroxyindolenine

E. heyneana (Wall.) T. Cooke syn. *Tabernaemontana heyneana* Wall. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 110).

Heyneanine from bark (*Tetrahedron Lett.* 1965, 3873); (-)-coronaridine, mp. 93° , from seeds (*Indian J. Chem.* 1966, 4, 99,332).

E. wallichiana (Steud.) Mehrotra & Rastogi, Comb. Nov. syn. *Tabernaemontana wallichiana* Steud.

n-Hentriacontane, mp. 67° and bauerenol acetate, mp. 283° , from leaves (*J. Indian Chem. Soc.* 1967, 44, 416).

Distribution : Grown in gardens.

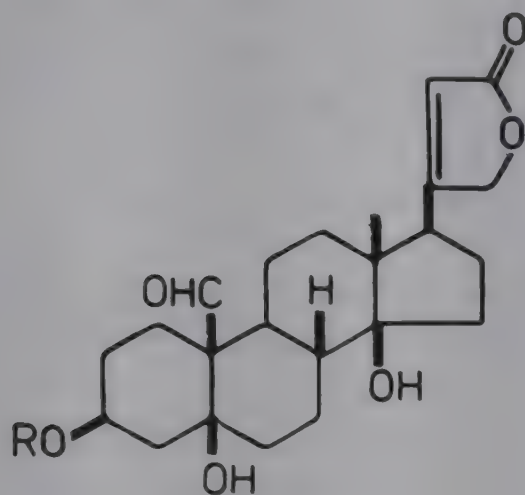
ERYSIMUM (Brassicaceae)

E. altacium C.A. Mey.

Cardiac glycosides - erysimoside and erysimine - present in plant (*Khim. Prir. Soedin.* 1967, 3, 173; *Chem. Abstr.* 1968, 68, 22194 x).

Distribution : Western Himalayas, alt. 2000-3000 m.

NEW COMPOUNDS



Erysimoside

R = Digilanidobiose

Erysimine

R = Digitoxose

ERYTHRINA (Papilionaceae)

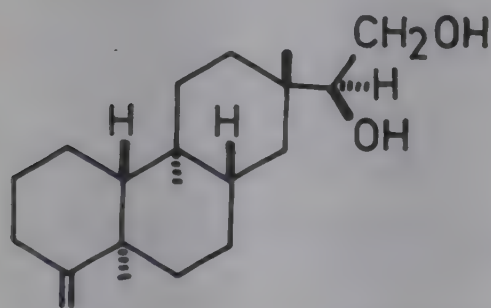
E. indica Lam.; see *E. variegata* L.*E. suberosa* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 111).Lecithins from seeds showing anti-H type specificity, have been studied for their modification with certain carbohydrates and their inhibition with secretor salivas (*Indian J. Med. Res.* 1967, 55, 369).*E. variegata* L. syn. *E. variegata* L. var. *orientalis* (L.) Merr., *E. indica* Lam. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 111).Docosyl alcohol, β -sitosterol, γ -sitosterol, mp. 148°, δ -sitosterol mp. 147°, three other substances having mp. 135°, 142°, and 126°, along with two unidentified products isolated from bark (*J. Sci. Ind. Res.* 1959, 18B, 494).*E. variegata* L. var. *orientalis* (L.) Merr.; see *E. variegata* L.

ERYTHROXYLUM (Erythroxylaceae)

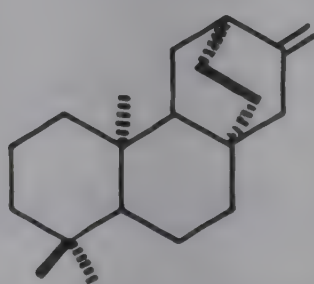
E. monogynum Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 111).Stachene, bp. 110°/0.02 mm and two related alcohols A and B, mp. 119° and 121° respectively, isolated; structures of alcohols A and B elucidated (*Chem. Ind.* 1964, 500); two new diterpenoids - erythroxydiol X, mp. 124°, erythroxydiol Y, mp. 144° - along with minor constituents erythroxytriol P and its monoacetate isolated from trunk wood as acetonides (*Tetrahedron Lett.* 1964, 1859); (+)hibaene, mp. 29°, hibaene epoxide, mp. 74° and a new

monoolefinic hydrocarbon mp. 84° , along with devadarool, mp. 124° , monogynol, mp. 119° and hydroxymonogynol, mp. 178° , isolated from wood; studies on structure and absolute configuration of monogynol; hydroxymonogynol confirmed as 17-hydroxymonogynol (*Tetrahedron Lett.* 1964, 1171, 2751); structures of devadarool (erythroxydiol X), allodevadarool (erythroxydiol Y), mp. 147° and hydroxydevadarool elucidated (*Tetrahedron Lett.* 1964, 3767); diterpene hydrocarbons - (-)pimaradiene, (-)atisirene, mp. 57° , (-)isoatisirene, mp. 84° , (+)devadarene, bp. $140^{\circ}/2$ mm., along with (+)hibaene isolated (*Tetrahedron Lett.* 1965, 2729); stereochemistry of erythroxydiols X, Y and Z elucidated by chemical and spectroscopic methods (*J. Chem. Soc. C* 1966, 268); erythroxytriols Q and P from trunk wood and their structure elucidation (*Tetrahedron Lett.* 1966, 2109; *J. Chem. Soc. C* 1967, 668); stereostructures of (+)hibaene, (+)stachene, erythroxytol A (monogynol), erythroxytol B and erythroxydiol A (hydroxymonogynol) assigned (*J. Chem. Soc. C* 1968, 2349); constitution and stereochemistry of 4β -hydroxy-18-norhibaene and its 4α -epimer (*J. Chem. Soc. C* 1968, 2529).

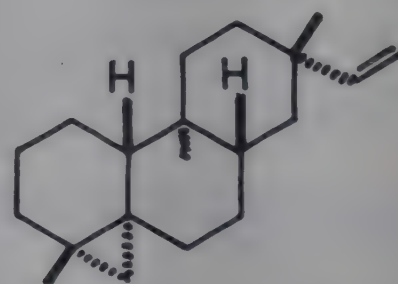
NEW COMPOUNDS



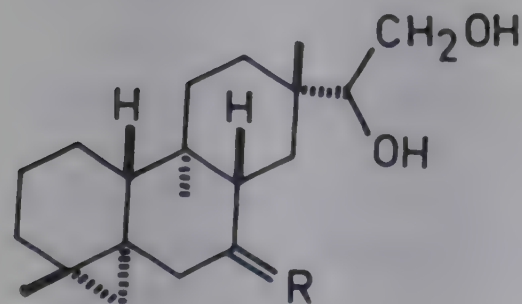
Allodevadarool



Atisirene



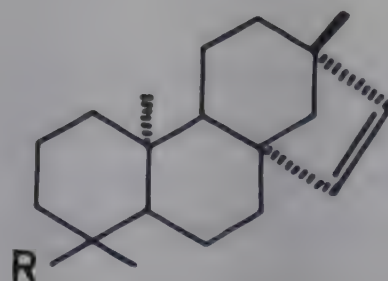
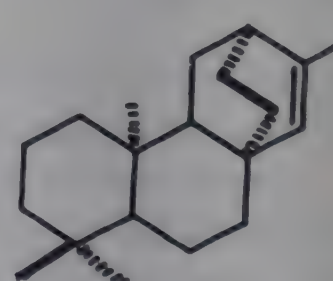
Devadarene



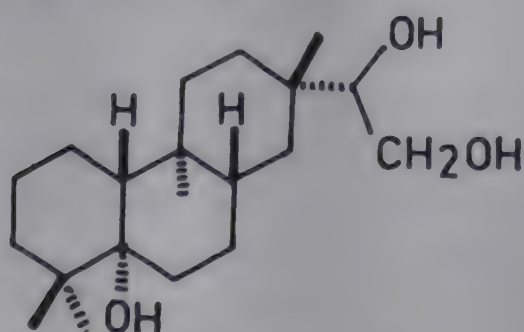
Devadarool

R = H, H

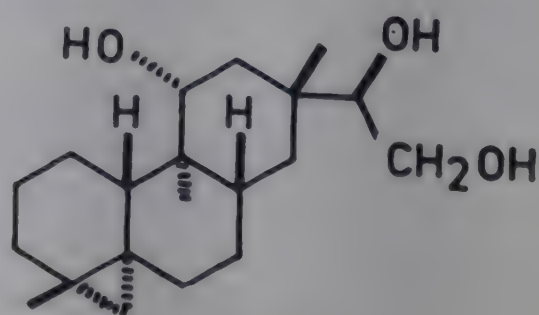
Hydroxydevadarool

R = H, β -OH 4α -Hydroxy-18-norhibaeneR = α -OH 4β -Hydroxy-18-norhibaeneR = β -OH

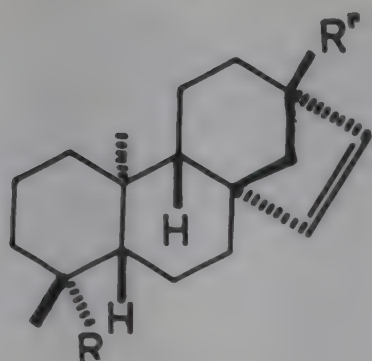
Isoatisirine



Erythroxytriol P



Erythroxytriol Q



Erythroxytol A

$R = CH_2OH, R' = Me$

Erythroxytol B

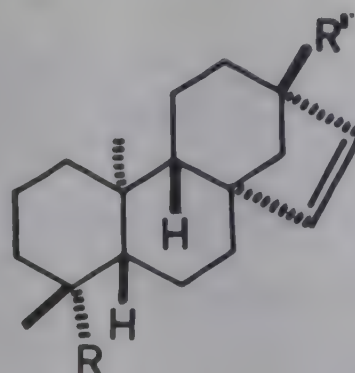
$R = Me, R' = CH_2OH$

Erythroxydiol A

$R, R' = CH_2OH$

(+)-Hibaene

$R, R' = Me$

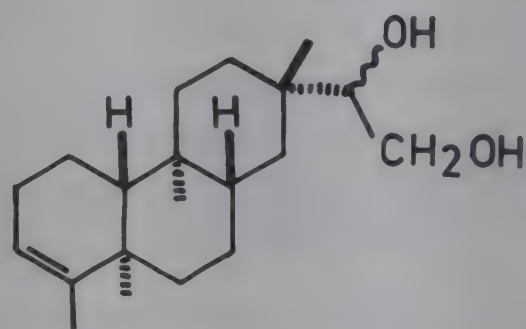


Alcohol A

$R = CH_2OH, R' = Me$

Alcohol B

$R = Me, R' = CH_2OH$



Erythroxydiol Z

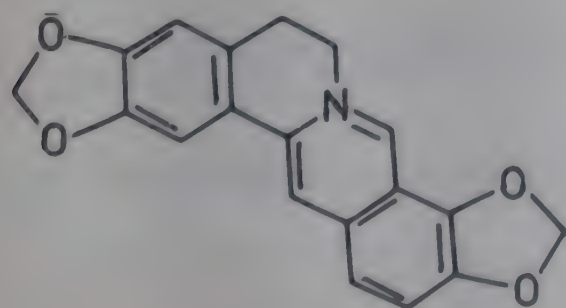
ESCHSCHOLZIA (Papaveraceae)

E. californica Cham.

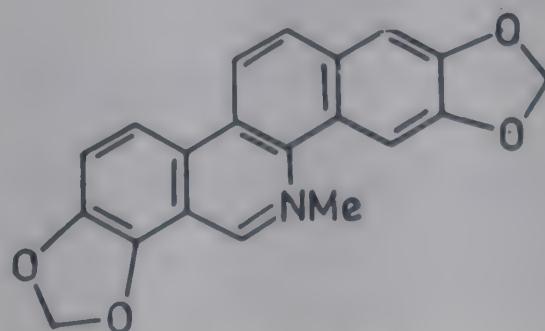
Allocryptopine, protopine, berberine, koptisine and seven unidentified alkaloids isolated from plant (*Acta Pol. Pharm.* 1964, 21, 127; *Chem. Abstr.* 1965, 62, 13507 d); β -allocryptopine, protopine, α -allocryptopine, chelerythrine, sanguinarine (ψ -chelerythrine), chelirubine, chelilutine and an unidentified tertiary base, mp. 238° , from roots (*Acta Pol. Pharm.* 1965, 22, 271; *Chem. Abstr.* 1966, 64, 3954); protopine, α -allocryptopine, lauroschoztine and a new base - eschscholtzine (californine) - isolated from aerial parts (*Acta Pol. Pharm.* 1965, 22, 354; *Chem. Abstr.* 1966, 64, 8636 e; *Can. J. Chem.* 1965, 43, 2180); structure of eschscholtzine (*Can. J. Chem.* 1965, 43, 2183); a new alkaloid - eschscholtzidine - was shown to be eschscholtzine in which a methylenedioxy group is replaced by two methoxys (*Can. J. Chem.* 1966, 44, 1259).

Distribution : The Californian poppy, popular ornamental herb in gardens.

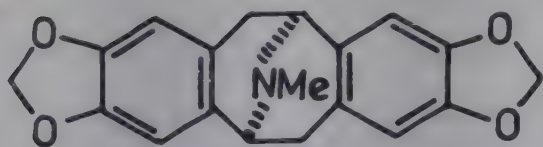
NEW COMPOUNDS



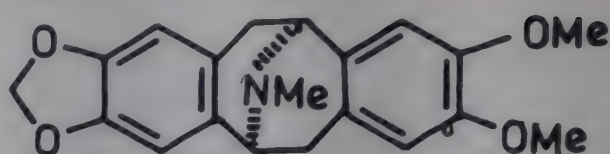
Koptisine



Sanguinarine



Eschscholtzine



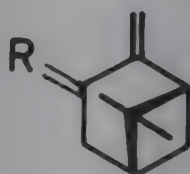
Eschscholtzidine

EUCALYPTUS (Myrtaceae)*E. cneorifolia* DC.

Eng. - Eucalyptus

Synthesis of (+)cryptone and (+)cryptol (*J. Indian Chem. Soc.* 1962, 39, 756)

Distribution : Introduced into India.

E. globulus Labill. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 112).Cis- and trans-pinocarveol isolated; stable derivatives of latter prepared (*Ann. Chem.* 1960, 634, 118); presence of α -pinene and an unsaturated α -ketone in leaves (*C.R. Acad. Sci. Paris*, Ser. D 1964, 259, 4391; *Chem. Abstr.* 1965, 62, 9456 f).**NEW COMPOUNDS**

Cis-Pinocarveol

R = H, β -OH

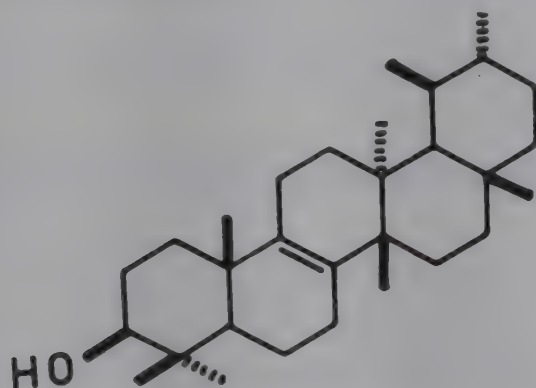
Trans-Pinocarveol

R = H, α -OH**EUGENIA** (Myrtaceae)*E. jambolana* Lamk.; see *Syzygium cumini* (L.) Skeels*E. jambos* L.; see *Syzygium jambos* (L.) Alston*E. javanica* Lamk.; see *Syzygium samarangense* (Bl.) Merr. & Perry*E. wallichii* Wight; see *Syzygium praecox* (Roxb.) Rathakr. & Nair**EULOPHIA** (Orchidaceae)*E. nuda* Lindl. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 112).n-Hexacosyl alcohol, a substance, mp. 82° and lupeol isolated (*Curr. Sci.* 1962, 31, 95).

EUODIA (EVODIA) (Rutaceae)

E. fraxinifolia (D. Don) Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 115).

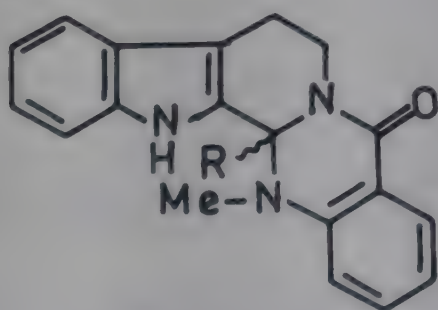
New pentacyclic triterpene alcohol - isobauerenol, mp. 162° - isolated from stem bark (*Tetrahedron Lett.* 1968, 5963).

NEW COMPOUNDS

Isobauerenol

E. ruticarpa (Juss.) Benth. (rutaecarpa) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 116).

Hydroxyevodiamine (rhetsinine, 0.01%), mp. 188° , isolated from leaves (*Yakugaku Zasshi* 1962, 82, 619; *Chem. Abstr.* 1963, 58, 3470 a); evodiamine (rhetsine), rutaecarpine along with hydroxyevodiamine and a lactone - limonin - isolated from plant and fruits (*Yao Hsueh Hsueh Pao* 1966, 13, 265; *Chem. Abstr.* 1966, 65, 3922 d; *Yakugaku Zasshi* 1967, 87, 608; *Chem. Abstr.* 1967, 67, 64601 n); in addition, a weak base - evocarpine - obtained from fruits (*Tetrahedron* 1967, 23, 1873); flavonoids - compounds C, mp. 245° , D, mp. 238° , and E, mp. 171° - isolated from leaves (*Diss. Pharm. Pharmacol.* 1967, 19, 655; *Chem. Abstr.* 1968, 68, 72232 d).

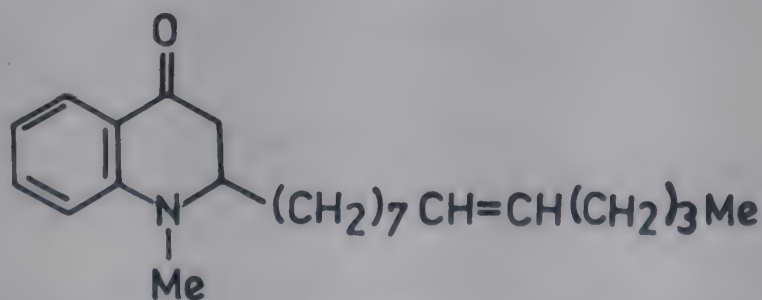
NEW COMPOUNDS

Evodiamine

R = H

Hydroxyevodiamine

R = OH



Evocarpine

EUONYMUS (Celastraceae)

E. tingens Wall. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 112).

An orange red benzoquinone derivative - tingenone, mp. 171° - isolated from stem bark (*Tetrahedron Lett.* 1962, 1047).

EUPATORIUM (Asteraceae)

E. odoratum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 113).

Ceryl alcohol, α -, β - and γ -sitosterol isolated from leaves (*Sci. Res.* 1967, 4, 154; *Chem. Abstr.* 1968, 68, 57405 u).

EUPHORBIA (Euphorbiaceae)

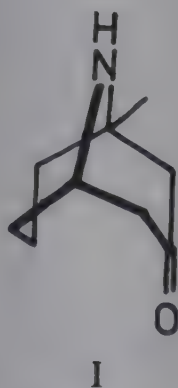
E. antiquorum L., (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 113).

Taraxerol, taraxerone, friedelan- 3α -ol, epifriedelinol, euphol and an unidentified compound, mp. 215° , from stems and roots (*Curr. Sci.* 1964, 583; *J. Indian Chem. Soc.* 1967, 44, 123); β -amyrin, euphadienol and euphorbol isolated as acetyl derivatives from latex (*Curr. Sci.* 1967, 36, 204).

E. atoto Forst.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 113).

New alkaloid (I) characterised as (+)9-aza-1-methylbicyclo[3.3.1]nonan-3-one isolated from plant (*Aust. J. Chem.* 1967, 20, 1967).

NEW COMPOUNDS



E. dracunculoides Lamk. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 113).

Plant extract showed two primary activities, cholinergic and direct action on different muscle preparations. Acetylcholine-like action with muscarinic as well as nicotinic activities were observed (*Indian J. Med. Res.* 1967, 55, 73).

Euphorbol, mp. 90° , and a flavone glycoside isolated from plant (*Indian J. Chem.* 1966, 4, 420).

E. helioscopia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 113).

A steroid, mp. 133° , a triterpenoid, mp. 183° and helioscopiol, mp. 75° , isolated (*J. Sci. Ind. Res.* 1967, 10, 167); quercetin-3,5-di-D-galactoside, mp. 196° , isolated from herb (*Agric. Biol.*

Chem. 1968, 32, 121; *Chem. Abstr.* 1968, 69, 10677 q).

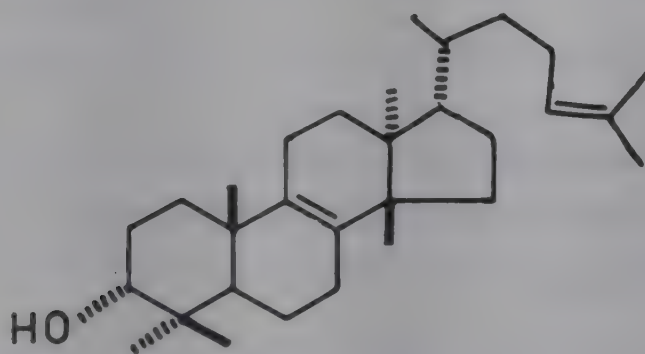
E. lathyrus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 114).

3,4-Dihydroxyphenylalanine, mp. 271° , isolated from latex (*Naturwiss.* 1961, 48, 304; *Chem. Abstr.* 1961, 55, 23688 e); β -sitosterol and n-hentriacontane isolated from seeds (*Rocz. Chem.* 1965, 39, 1233; *Chem. Abstr.* 1966, 64, 14596 c).

E. neriifolia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 144).

Euphol, mp. 116° and a new monohydroxytriterpene - nerifoliol, mp. 130° - isolated from latex (*Curr. Sci.* 1965, 34, 432).

NEW COMPOUNDS



Nerifoliol

E. pulcherrima Willd. ex Klotzsch

Eng. - Poinsettia

A new amino acid - N-acetyldiaminobutyric acid, mp. 208° - isolated from latex (*Phytochemistry* 1962, 1, 87); germanicol, β -amyrin, pseudotaraxasterol isolated from latex, stems and flowers; a new sterol - pulcherrol, mp. 115° - from latex; octaicosanol and β -sitosterol from stem (*J. Pharm. Sci.* 1964, 56, 1184); germanicol acetate, mp. 275° , isolated from plant (*J. Indian Chem. Soc.* 1967, 44, 159).

Distribution : Native of Central America, grown as ornamental in gardens.

E. resinifera Berg. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 114).

A dilactonic acid, mp. 152° , isolated (*Medd. Nor. Farm. Selsk.* 1963, 25, 77; *Chem. Abstr.* 1963, 59, 15602 e).

E. royleana Boiss. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 114).

Taraxerol, and ellagic acid, mp. 360° , isolated from plant (*Indian J. Chem.* 1964, 2, 254); 2,3-dimethoxyellagic acid, succinic acid and an unidentified compound, mp. 181° , isolated (*Pakistan J. Sci. Ind. Res.* 1966, 9, 38; *Chem. Abstr.* 1967, 67, 71109 m).

E. sikkimensis Boiss.

Glut-5-en-3-one, butyrospermol, β -sitosterol, 1-hexacosanol and a triterpene isolated (*J. Indian Chem. Soc.* 1969, 46, 331).

Distribution : Sikkim & Bhutan, alt. 2400-3000 m.

E. thymifolia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 114).

Compounds A, mp. 187°, B and C isolated (*Pakistan J. Sci. Ind. Res.* 1965, 8, 293; *Chem. Abstr.* 1966, 64, 1013 b).

BIOLOGICAL ACTIVITY

Compounds A and C inhibited growth of *Escherichia coli* and *Bacillus subtilis* but had no effect on *B. cercus* and *Staphylococcus aureus*. Compound B did not inhibit growth of any of these four organisms (*Pakistan J. Sci. Ind. Res.* 1965, 8, 293; *Chem. Abstr.* 1966, 64, 1013 b).

E. tirucalli L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 115).

Hentriacontane, hentriacontanol, β -sitosterol, taraxerol, 3,3'-di-O-methylellagic acid and ellagic acid isolated from stems (*Indian J. Pharm.* 1967, 29, 152).

EXCOECARIA (Euphorbiaceae)

E. agallocha L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 116).

A wax (14.21%) and mannitol obtained from latex; wax composed of unsaponifiable matter (45%) which gave exocarol, mp. 99°, agalocol, mp. 220° and isoagalocol, mp. 217° (*Sci. Res.* 1964, 1, 211; *Chem. Abstr.* 1965, 62, 8015 g).

FAGONIA (Zygophyllaceae)

F. arabica Hook.f.; see *F. schweinfurthii* Hadidi

F. cretica L.; see *F. schweinfurthii* Hadidi

F. schweinfurthii Hadidi syn. *F. cretica* auct. (non L.),

F. arabica sensu Hook.f. p.p. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 116).

Isolation of ceryl alcohol, β -sitosterol and n-triacontanol (*Vijnana Parishad Anusandhan Patrika* 1966, 9, 87; *Chem. Abstr.* 1967, 67, 97686 x; *J. Chem. U.A.R.* 1969, 12, 119; *Chem. Abstr.* 1969, 71, 761 q); chinovic acid, mp. 305°, from hydrolysate of plant extract (*Pakistan J. Sci. Ind. Res.* 1966, 9, 269; *Chem. Abstr.* 1967, 67, 32887 u); fagogenin, mp. 307°, genin A, mp. 326°, and genin B, mp. 247° (*Pakistan J. Sci. Ind. Res.* 1966, 9, 41; *Chem. Abstr.* 1968, 68, 22091 m; *Pakistan J. Sci. Ind. Res.* 1967, 10, 140; *Chem. Abstr.* 1968, 69, 10576 f); stigmasterol and campesterol isolated from Egyptian plant (*J. Chem. U.A.R.* 1969, 12, 119; *Chem. Abstr.* 1969, 71, 761 q).

FAGOPYRUM (Polygonaceae)

F. cymosum Meissn.; see *F. dibotrys* (D. Don) Hara

F. dibotrys (D. Don) Hara syn. *F. cymosum* Meissn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 117).

A new glycoside - shakurichin - isolated from rhizomes which was hydrolysed to p-coumaric acid and glucose (*Kanazawa Daigaku Yakugakubu Kenkyu Nempo* 1961, 11, 1; *Chem. Abstr.* 1962, 56, 1526 c); quercitrin, quercetin and rutin present in herb (*Kumamoto Pharm. Bull.* No. 5, 1962, 56; *Chem. Abstr.* 1964, 60, 5891 e).

F. esculentum Moench (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 117).

Presence of rutin, quercetin and 4 unidentified flavonoids by PC (*Bull. Fac. Pharm.* 1963, 2, 107; *Chem. Abstr.* 1965, 62, 5574 f).

BIOLOGICAL ACTIVITY

Perfusion of quercetin (2-20 ppm) in rats and guinea pigs decreased permeability of dermal capillary walls. It was about 1.3 times as active as rutin. It showed a transitory vasodilator effect. At 40 ppm, it lowered tonus of smooth musculature and showed about five times the spasmolytic activity of rutin (*Farmakol. i Toksikol.* 1962, 25, 71; *Chem. Abstr.* 1962, 57, 14389 b).

FAGUS (Fagaceae)

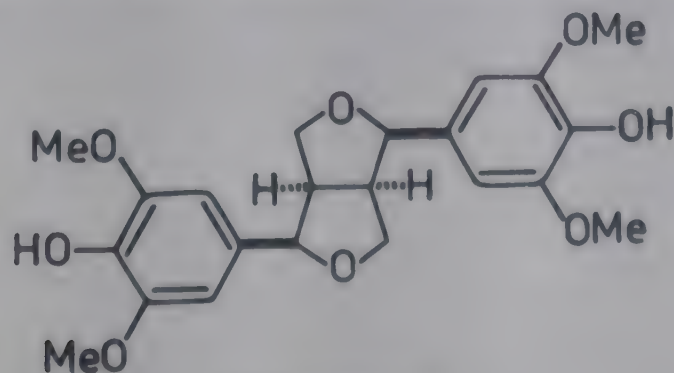
F. sylvatica L.

Eng. - European beech.

Seeds claimed to be toxic due to large concentration of oxalic acid and soluble oxalates. Adverse reaction manifested by experimental rats after six weeks on a diet containing 50% addition of beech seeds has indicated that the seeds are unsuitable for human nutrition (*Nahrung* 1959, 3, 213; *Chem. Abstr.* 1960, 54, 5842 f).

dl-Syringaresinol, mp. 170°, from beech wood (*Chem. Ber.* 1965, 98, 538); p-hydroxybenzoic, vanillic, p-hydroxycinnamic, ferulic, sinapic and caffeic acids isolated from seed cake (*Naturwiss.* 1965, 52, 208; *Chem. Abstr.* 1965, 63, 3310 g).

Distribution : Grown in Nilgiris and Kulu as ornamental plant.

NEW COMPOUNDS

Syringaresinol

FERNANDOA (Bignoniaceae)

F. adenophylla (Wall. ex G. Don) V. Steenis syn. *Heterophragma adenophyllum* Seem. ex Benth. & Hook., *Bignonia adenophylla* Wall. ex G. Don

Assam - Dhopa-paruti, Lotumpoh; Trade - Karen wood.

β -Sitosterol and allantoin, mp. 238°, isolated (*Indian J. Appl. Chem.* 1968, 31, 235; *Chem. Abstr.* 1969, 71, 57573 j).

Distribution : Assam, Bengal and Andamans. Also planted as avenue tree and in gardens in big cities.

FERONIA (Rutaceae)

F. elephantum Correa; see *F. limonia* (L.) Swingle

Feronia limonia (L.) Swingle, syn. *F. elephantum* Correa (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 117).

Two unidentified compounds isolated from bark (*Curr. Sci.* 1959, 28, 213); feronolide, mp. 115°, from bark (*Arch. Pharm.* 1964, 297, 236; *Chem. Abstr.* 1964, 60, 15807 g); feronone, mp. 195°, from bark (*Labdev* 1967, 5, 64; *Chem. Abstr.* 1967, 66, 102471 j).

BIOLOGICAL ACTIVITY

Feronolide was a potent depressor of blood pressure and stimulant of gut. It had potent parasympathomimetic properties (*Indian J. Med. Res.* 1963, 51, 48); feronone showed depressant action on frog heart (*Labdev* 1967, 5, 64; *Chem. Abstr.* 1967, 66, 102471 j).

FERULA (Apiaceae)

F. alliacea Boiss. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 117).

Ferulin resolved by chromatography into phellopterin and byakangelicol (*Arch. Pharm.* 1962, 295, 248; *Chem. Abstr.* 1963, 58, 519 e).

FIBRAUREA (Menispermaceae)

F. tinctoria Lour. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 118).

Isolation of palmatine and two unknown alkaloids - fibranine and fibraminine, mp. 192° - along with a neutral substance - fibralactone, mp. 278° - and a sterol, mp. 136° (*Hua Hsueh Hsueh Pao* 1962, 28, 89; *Chem. Abstr.* 1964, 60, 6887 g).

FICUS (Moraceae)

F. benghalensis L. (bengalensis) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 118).

Bark showed hypoglycaemic activity in both normal and alloxan diabetic rats; activity was more marked after adequate period of fasting (*Indian J. Med. Res.* 1960, 48, 162); LD50 of plant extract in mice was 9.47 g/kg by i.p. route. In chronic toxicity test, extract produced hepatic damage initially but changes were reversible even on continued administration (*Indian J. Med. Res.* 1962, 50, 737).

Isolation of friedelin and β -sitosterol from leaves (*J. Indian Chem. Soc.* 1968, 45, 285).

BIOLOGICAL ACTIVITY

A glucoside isolated from bark was ineffective in diabetic animals, but lowered fasting blood sugar of normal animals (*Indian J. Physiol. Pharmacol.* 1960, 49, 182).

F. carica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 118).

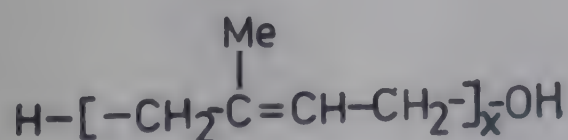
Spectrophotometric estimation of bergapten and psoralen contents in leaves (*Farm. Ed. Sci.* 1959, 14, 679; *Chem. Abstr.* 1960, 54, 10070 f); isolation of taraxasterol, β -sitosterol, lupeol, β -amyrin along with psoralen and bergapten from leaves (*J. Chem. Soc.* 1962, 4253; *Phytochemistry* 1964, 3, 701); psoralen, bergapten, octacosane and three furocoumarins, mp. 160°, 182° and 140°, from leaves; palmitic and valeric acids, p-cymene, cadalene, octacosane and tricosane from essential oil (0.35%) (*Nippon Nogeikagaku Kaishi* 1959, 33, 1025; *Chem. Abstr.* 1963, 58, 5401 e).

F. elastica Roxb.

Eng. - Assam rubber, Indian rubber; B. & Assam - Bor, Attah bor.

Structures of polyprenols - ficaprenol-10, -11 and -12 - from the leaves, determined; these are probably same as castaprenol-10, -11 and -12 (*Biochem. J.* 1967, 102, 325).

Distribution : Foothills of Himalayas from Nepal eastwards to Assam and Khasi Hills, ascending to about 1000 m.

NEW COMPOUNDS

Ficaprenol-10

x = 10

Ficaprenol-11

x = 11

Ficaprenol-12

x = 12

F. glomerata Roxb.; see *F. racemosa* L.

F. racemosa L. syn. *F. glomerata* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 119).

A glycoside-rich fraction from leaves reported to have hypotensive and cardiac-depressive effects. It had no effect on behaviour in rats or on isolated tissue preparations (*Indian J. Med. Res.* 1969, 57, 1070).

F. religiosa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 119).

The bark extract has varying degree of relaxant and spasmolytic effects on various smooth muscles in different species of animals. Its spasmolytic ED₅₀ against acetylcholine, histamine, barium chloride and serotonin was in the ratio of 1:4.5:12:21. The extract blocked cardiovascular effects of acetylcholine but not those of histamine and was also vagolytic. It has no antiacetylcholine action at autonomic ganglia and skeletal myoneural junctions. Its LD₅₀ in rats was 2.24 and 0.80 g/kg by oral and i.v. routes respectively (*Indian J. Med. Res.* 1960, 48, 734).

β -Sitosterol-D-glucoside injected i.v. into rabbits at 5.0 and 7.5 mg/kg, decreased blood sugar by 23.2 and 33.86% respectively. It produced CNS stimulation, convulsions and reversal of reserpine depression in mice at toxic doses (40-400 mg/kg); LD₅₀ was 62 mg/kg, i.p. in mice (*Indian J. Pharm.* 1967, 29, 91).

FLUEGGIA (Euphorbiaceae)

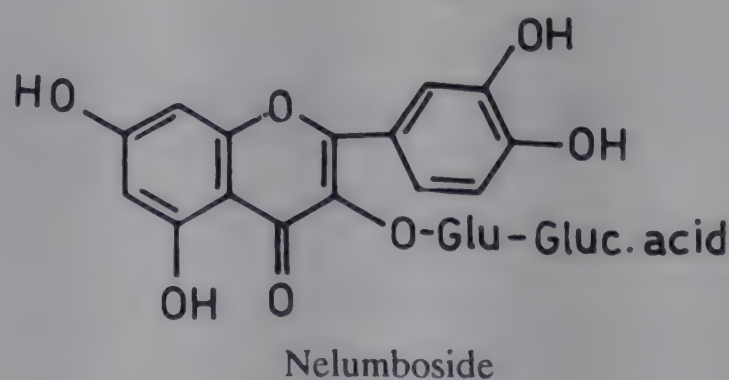
F. microcarpa Blume; see *Securinega virosa* (Roxb. ex Willd.) Baillon

FOENICULUM (Apiaceae)

F. vulgare Mill. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 121).

Nelumboside, mp. 174°, isolated from leaves and characterised as quercetin-3-glucoglucuronide (*Yakugaku Zasshi* 1961, 81, 1158; *Chem. Abstr.* 1962, 56, 1527 d); anethole detected in essential oil from fruits (*Planta Med.* 1967, 15, 30).

NEW COMPOUNDS



FORTUNELLA (Rutaceae)

F. japonica (Thunb.) Swingle syn. *Citrus japonica* Thunb.

Eng. - Round or Marumi kumquat.

Essential oil fractionated; one fraction contained α -pinene (*Indian Perfum.* 1957, 1, 36; *Chem. Abstr.* 1961, 55, 23940 e).

Distribution : Native of East Asia, grown in north India for edible fruits.

FRAGARIA (Rosaceae)

F. chiloensis (L.) Duchesne

Eng. - Strawberry.

Naturally-occurring cyclic imino acid - pipecolic acid - accumulated in leaves when plant was sprayed with maleic anhydride solution which is a growth inhibitor (*Science* 1959, 130, 864).

Distribution : Native of Pacific coast of North and South America, cultivated in Kumaon, Kulu, Himachal Pradesh, Maharashtra and elsewhere for edible fruits.

F. vesca L.

Eng. - Alpine strawberry.

d-Catechin, quercetin, kaempferol, cyanidin and leucocyanidin from leaves (*Proc. Am. Soc. Hort. Sci.* 1964, 85, 325; *Chem. Abstr.* 1965, 62, 10825 h).

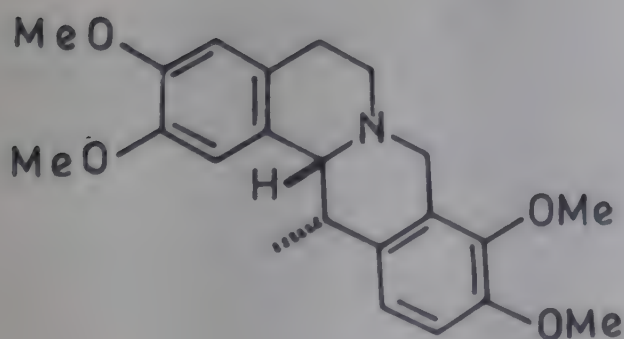
Distribution : Temperate Himalayas from Kashmir to Sikkim, alt. 1500 - 3000 m.

FUMARIA (Fumariaceae)

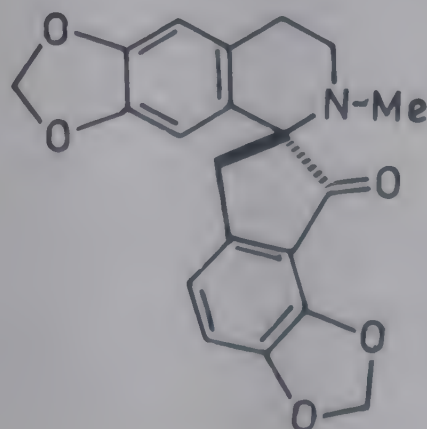
F. officinalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 122).

Detection of alkaloids - corydaline, protopine, bulbocapnine and dicentrine by PC (*Trav. Soc. Pharm. Montpellier* 1962, 21, 28; *Chem. Abstr.* 1962, 57, 2331 c); stereochemistry of corydaline (*Experientia*, 1965, 21, 690); alkaloids - fumarophycine, mp. 107°, protopine and sinactine - isolated from Bulgarian plant (*C. R. Acad. Bulg. Sci.* 1967, 20, 557; *Chem. Abstr.* 1967, 67, 117013 f); known alkaloid - scoulerine - and three new bases - fumaricine, fumaritine and fumariline - isolated; structures of new bases established (*Can. J. Chem.* 1968, 46, 2873; *ibid.* 1969, 47, 1103, 3593).

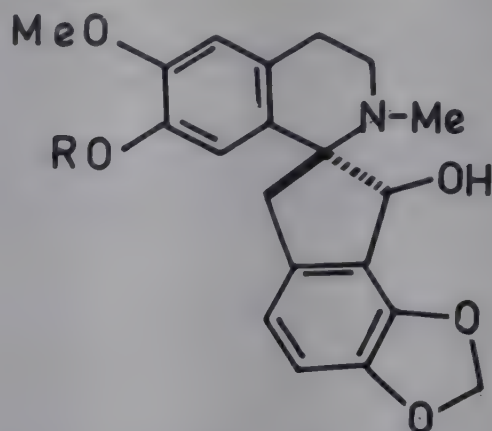
NEW COMPOUNDS



Corydaline



Fumariline



Fumaricine

R = Me

Fumaritine

R = H

F. parviflora Lamk. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 122).

Isolation of protopine, cryptopine, d-bicuculline, 1-adlumine, fumaridine, fumaramine and d- α -hydrastine, mp. 158° (*Khim. Prir. Soedin.* 1968, 4, 194; *Chem. Abstr.* 1968, 69, 57449 g).

FUNTUMIA (Apocynaceae)

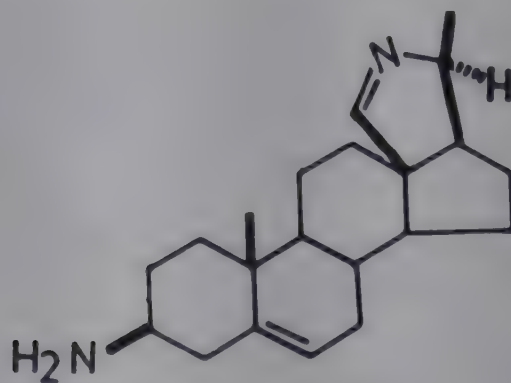
F. elastica Stapf

Eng. - Logos silk rubber, Ire rubber.

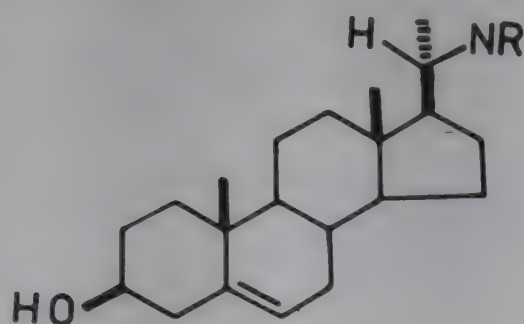
Isolation of irehine (20 α -dimethylaminopregn-5-en-3 β -ol), mp. 174°, irehamine (20 α -methylaminopregn-5-en-3 β -ol) and two new bases - irehdiamine A (3 β ,20 α -diaminopregn-5-ene) and irehdiamine B (3 β -methylamino-20 α -aminopregn-5-ene) - from leaves; structures of irehine and irehamine confirmed by synthesis from holafebrine (*Bull. Soc. Chim. Fr.* 1963, 594, 2332); isolation and structure elucidation of irehline (conkurchine), mp. 118° (*Bull. Soc. Chim. Fr.* 1963, 1977); cycloartenol, 31-norlanosterol, 24-dehydrolophenol, desmosterol and irehdiamines isolated from seeds (*C.R. Acad. Sci. Paris, Ser. C* 1969, 268, 2105; *Chem. Abstr.* 1969, 71, 88402 g).

Distribution : Native of tropical W. Africa, introduced into India and tried in the Nilgiris and elsewhere as a substitute for rubber tree, but yield of rubber is low.

NEW COMPOUNDS



Irehline



Irehamine

R = H, Me

Irehine

R = Me

FURCRAEA (Amaryllidaceae)*F. foetida* (L.) Haw. syn. *F. gigantea* Vent.

Eng. - Mauritius hemp.

Tigogenin (0.083%), hecogenin and chlorogenin (0.25%), isolated from leaves (*J. Chem. U.A.R.* 1961, 4, 257; *Chem. Abstr.* 1964, 60, 366 b).

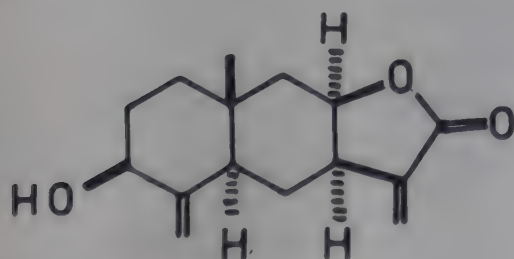
Distribution : Native of tropical America, introduced into India as garden plant.

F. gigantea Vent.; see *F. foetida* (L.) Haw.

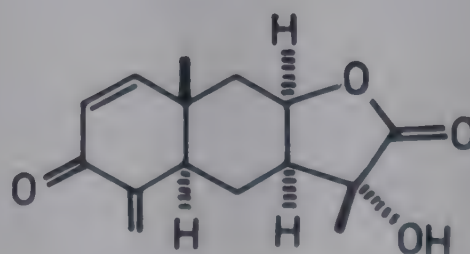
GAILLARDIA (Asteraceae)*G. aristata* Pursh

Structures of sesquiterpene lactones - 3-epi-isotelekin and farinosin - elucidated (*J. Org. Chem.* 1968, 33, 3743).

Distribution : Grown in gardens as ornamental plant.

NEW COMPOUNDS

3-Epi-isotelekin



Farinosin

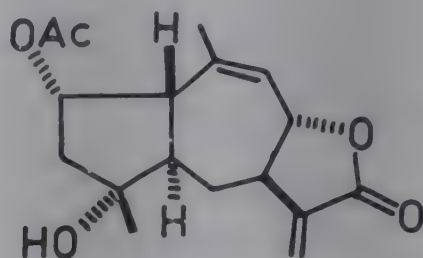
G. pulchella Fougier

A sesquiterpene lactone, pulchellin, mp. 165°, isolated and structure elucidated (*Tetrahedron* 1963, 19, 483); isolation of pulchellin B, mp. 215°, pulchellin C, mp. 199° and pulchellin D, mp. 182° (*Tetrahedron* 1964, 20, 341); stereochemistry of gaillardin, isolated from plant, by X-ray analysis (*Tetrahedron Lett.* 1969, 973); isolation of two new pseudo-guaianolides - pulchellin E and pulchellin F - in addition to pulchellin B and pulchellin C (*Phytochemistry* 1969, 8, 661); isolation of pulchellidine, mp. 185°, and a minor nonbasic

constituent, mp. 225°; structure of pulchellidine elucidated (*Tetrahedron Lett.* 1969, 2073).

Distribution : American plant, grown in gardens in Maharashtra and elsewhere.

NEW COMPOUNDS



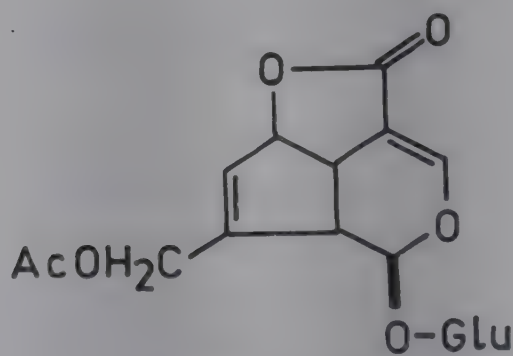
Gaillardin

GALIUM (Rubiaceae)

G. aparine L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 122).

Structure of iridoid glucoside - asperuloside (*Chem. Ind.* 1961, 403).

NEW COMPOUNDS



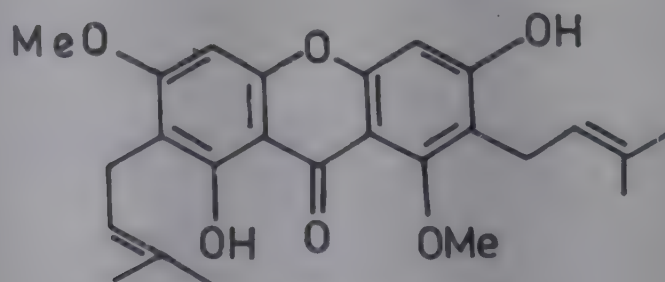
Asperuloside

GARCINIA (Clusiaceae)

G. mangostana L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 123).

Structure of β -mangostin from latex, shown as 1,6-dihydroxy-3,7-dimethoxy-2,8-bis-(3-methyl-2-butenyl)xanthone (*Can. J. Chem.* 1966, 46, 3770).

NEW COMPOUNDS

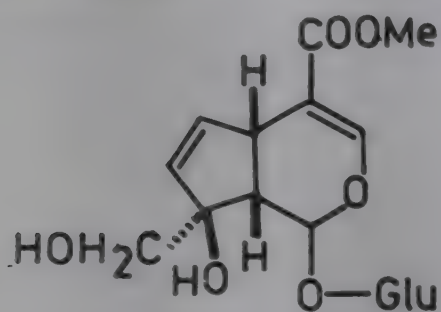


β -Mangostin

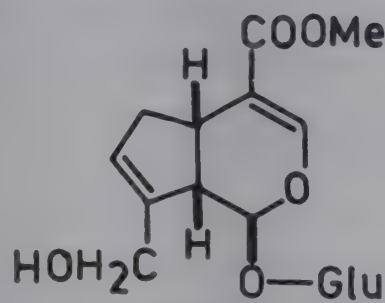
GARDENIA (Rubiaceae)

G. jasminoides Ellis (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 123).

Nonacosane, β -sitosterol, D-mannitol and two pigments from fruits (Yao Hsueh Hsueh Pao 1964, 11, 342; *Chem. Abstr.* 1964, 61, 8130 c); two new iridoid glucosides - gardenoside, mp. 118° and geniposide - from fruits, leaves and stalks (*Tetrahedron Lett.* 1969, 2347).

NEW COMPOUNDS

Gardenoside

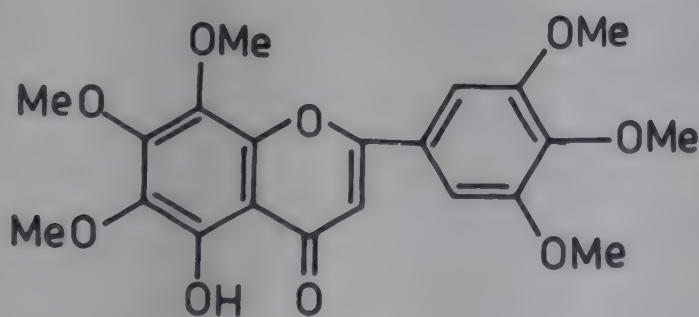


Geniposide

G. lucida Roxb.; see *G. resinifera* Roth.

G. resinifera Roth syn. *G. lucida* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 123).

Structure of gardenin established as 5-hydroxy-6,7,8,3',4',5'-hexamethoxyflavone (*Indian J. Chem.* 1968, 6, 677).

NEW COMPOUNDS

Gardenin

GELONIUM (Euphorbiaceae)

G. multiflorum Juss.; see *Suregada multiflora* (Juss.) Baill.

GELSEMIUM (Loganiaceae)

G. elegans (Gardn. & Champ.) Benth.

Eng. - Chinese Gelsemium.

Isolation of two new minor alkaloids - koumicine, mp. 232° and koumidine, mp. 202° besides previously reported koumine, kouminidine, gelsemine; chemical studies on koumine (Hua Hsueh Hsueh Pao 1961, 27, 47; *Chem. Abstr.* 1963, 59, 14041 a).

Distribution : Khasi and Lushai Hills and Manipur.

GENTIANA (Gentianaceae)

G. dahurica Fisch.; see *G. olivieri* Griseb.

G. olivieri Griseb. syn. *G. dahurica* Fisch. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 124).

Oleanolic acid and ursolic acid from flowers (*Indian J. Chem.* 1963, 1, 409); alkaloids - gentiananine, mp. 375° decomp., gentianin and gentianadine, mp. 77° - isolated from aerial parts (*Khim. Prir. Soedin.* 1967, 3, 182; *Chem. Abstr.* 1967, 67, 117007 g).

GERANIUM (Geraniaceae)

G. collinum Stephan ex Willd.

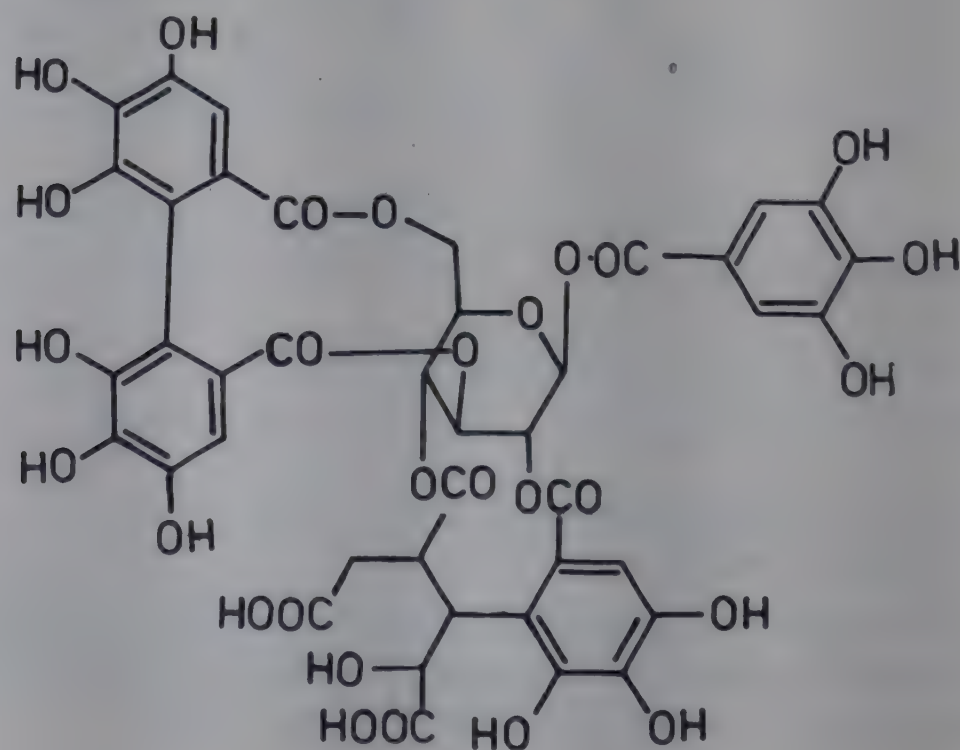
Gallic acid, 3-methoxygallic acid, quercetin, kaempferol and 3,7,8,4'-tetrahydroxyflavone from leaves (*Khim. Prir. Soedin.* 1968, 4, 67; *Chem. Abstr.* 1968, 68, 112178 z); isolation of quercetin-3 α -L-arabinofuranoside, mp. 217° and quercetin-3 α -L-arabinopyranoside, mp. 237°, from leaves (*Khim. Prir. Soedin.* 1968, 4, 381; *Chem. Abstr.* 1969, 70, 75089 q).

Distribution : Western Himalayas from Kashmir to Kumaon, Nepal and Sikkim, alt. 3000 - 4800 m.

G. pratense L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 124).

An unidentified steroid, mp. 136°, catechin, tannin, gallic acid, L-epicatechin, D-catechin, chebulagic acid, 6-galloylglucose and ellagic acid from rhizomes (*Arch. Pharm.* 1962, 295, 823; *Chem. Abstr.* 1963, 58, 13712 d).

NEW COMPOUNDS



Chebulagic acid

G. rectum Trautv.

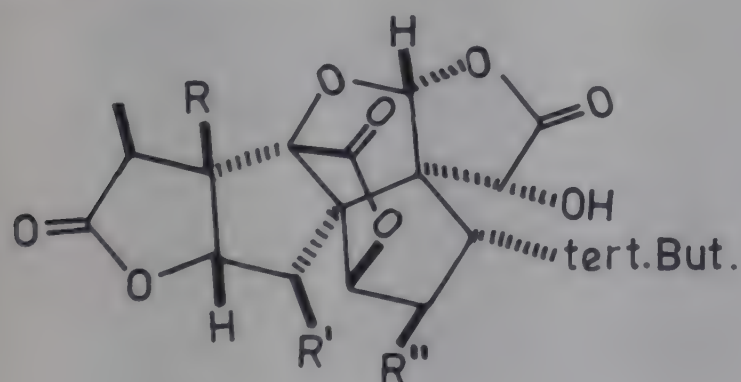
Detection of (-)epigallocatechol, l-gallocatechol, (-)epicatechol, (\pm)catechol and (-)epicatechol gallate in roots and (+)catechol in stalks by PC (*Khim. Prir. Soedin.* 1968, 4, 265; *Chem. Abstr.* 1969, 70, 44832 x).

Distribution : Kashmir Himalayas, alt. 3000-3500 m.

GINKGO (Ginkgoaceae)*G. biloba* L.

Structure of a sesquiterpene - bilobalane (*Yakugaku Zasshi* 1962, 82, 214; *Chem. Abstr.* 1963, 58, 5728 h); kaempferol-3-rhamnoglucoside, mp. 185° and rutin from leaves (*Z. Naturforsch.* 1965, 20B, 1139; *Chem. Abstr.* 1966, 64, 11554 b); isolation and characterisation of four ginkgolides - ginkgolide A, ginkgolide B, ginkgolide C and ginkgolide M (*Tetrahedron Lett.* 1967, 249; *Chem. Commun.* 1967, 259; *Pure Appl. Chem.* 1967, 14, 89; *Chem. Abstr.* 1967, 67, 53728 m); revised structure and absolute configuration of bilobanone established (*Chem. Commun.* 1967, 678; *Yakugaku Zasshi* 1968, 88, 562; *Chem. Abstr.* 1968, 69, 59425 v); quercetin, octaacetyl isoquercitrin, mp. 170°, and an unknown substance, mp. 190°, (-)epicatechin acetate, mp. 152°, and (-)epigallocatechin hexaacetate mp. 141°, from fresh leaves (*Arzneim. Forsch.* 1968, 18, 539); a new sesquiterpene - bilobalide A - from leaves (*Ann. Chem.* 1969, 724, 214; *Chem. Abstr.* 1969, 71, 61569 c).

Distribution : Native of China, occasionally planted in hill gardens.

NEW COMPOUNDS

Ginkgolide A

R = OH, R', R'' = H

Ginkgolide B

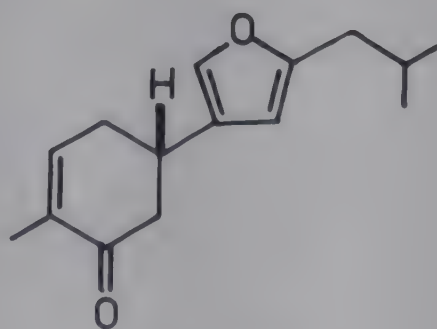
R, R' = OH, R'' = H

Ginkgolide C

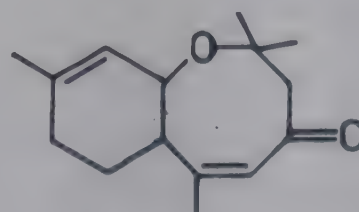
R, R', R'' = OH

Ginkgolide M

R = H, R', R'' = OH



Bilobanone



Bilobalane

GIRARDINIA (Urticaceae)

G. heterophylla Decne.; see *G. palmata* (Forsk.) Gaud.

G. palmata (Forsk.) Gaud. syn. *G. heterophylla* Decne.

Presence of 5-hydroxytryptamine and histamine demonstrated biologically and by PC (*J. Pharm. Pharmacol.* 1964, 16, 361; *Chem. Abstr.* 1964, 61, 1705 h).

Distribution : Temperate and subtropical Himalayas, from Kashmir eastwards, ascending to 2000 m. hilly regions of north-east and south India.

GLEDITSIA (Caesalpiniaceae)

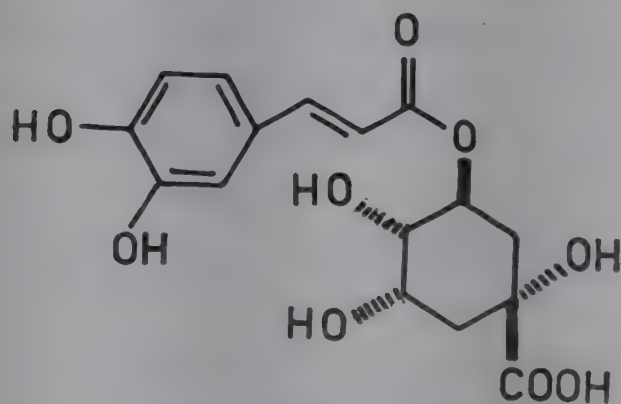
G. triacanthos L.

Eng. - Common honeylocust.

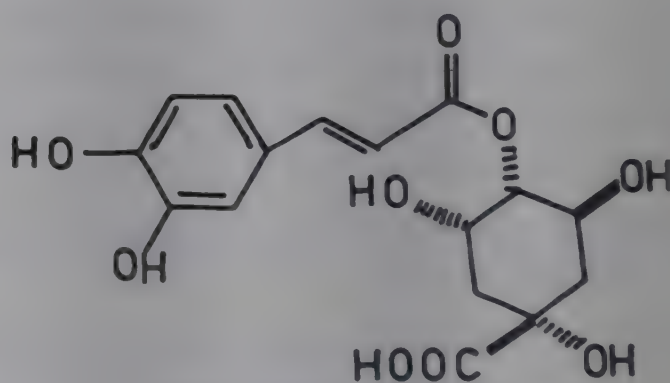
Isolation of triacanthine and assignment of structure as 6-amino-7-(γ,γ -dimethylallyl)purine (*J. Am. Chem. Soc.* 1960, 82, 6202); isolation and structure of two isomeric chlorogenic acids - cryptochlorogenic and neochlorogenic acids (*Ann. Chem.* 1966, 691, 181).

Distribution : Native of America. Planted in India as a roadside or hedge tree.

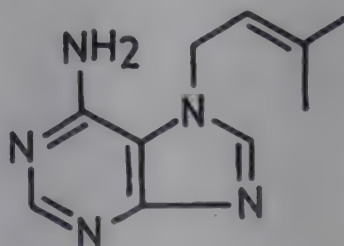
NEW COMPOUNDS



Cryptochlorogenic acid



Neochlorogenic acid



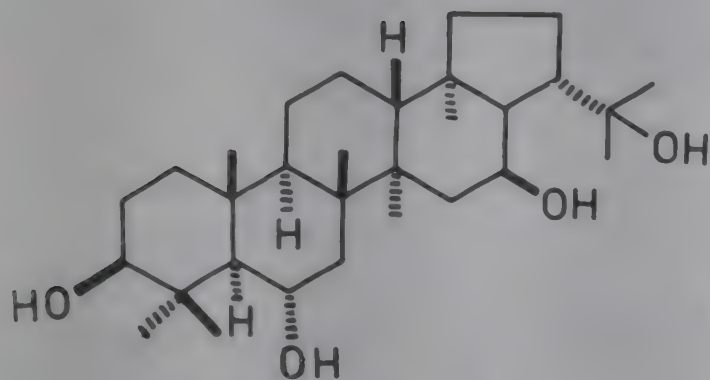
Triacanthine

GLINUS (Ficoidaceae)

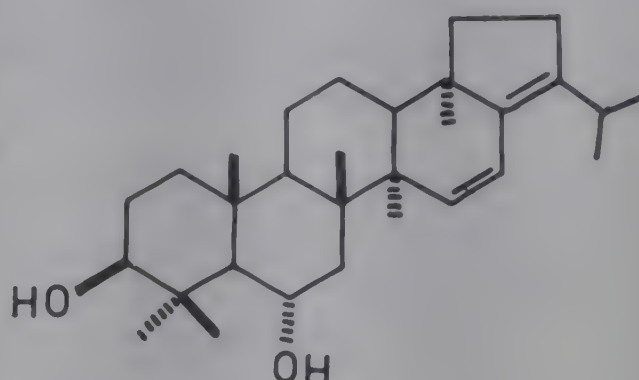
G. lotoides L. syn. *Mollugo lotoides* (L.) Kuntze, *M. hirta* Thunb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 168).

Mollugogenol A, mp. 250°, isolated (*J. Indian Chem. Soc.* 1967, 44, 454); mollugogenols A and B characterised as 3 β ,6 α ,16 β ,22-tetrahydroxy-isohopane (*Tetrahedron* 1969, 25, 3301; *J. Indian Chem. Soc.* 1969, 46, 98) and 3 β ,6 α -dihydroxyhopa-15,17(21)-diene respectively (*J. Indian Chem. Soc.* 1969, 46, 96).

NEW COMPOUNDS



Mollugogenol A

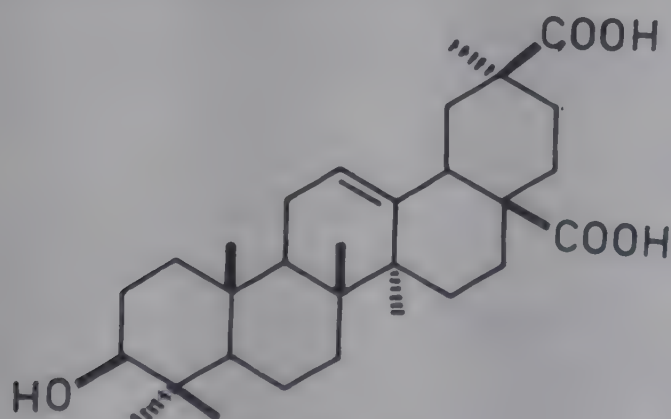


Mollugogenol B

G. oppositifolius (L.) A. DC. syn. *Mollugo oppositifolia* L., *M. spergula* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 168).

Hydrolysis of saponin mixture yielded new sapogenin - spergulagenin A, mp. 278° (*Indian J. Chem.* 1964, 2, 339; *J. Indian Chem. Soc.* 1965, 42, 137); chemical studies on spergulagenin A (*J. Indian Chem. Soc.* 1967, 44, 242); new sapogenin from crude saponin hydrolysate - spergulagenic acid, mp. 347° - characterised as 3β-hydroxyolean-12-ene-28,30-dioic acid (*Indian J. Chem.* 1965, 3, 283; *J. Indian Chem. Soc.* 1966, 43, 41; *Bull. Nat. Inst. Sci. India* No. 37, 1968, 74; *Chem. Abstr.* 1969, 71, 61590 e; *Tetrahedron* 1968, 24, 1107).

NEW COMPOUNDS



Spergulagenic acid

GLIRICIDIA (Papilionaceae)

G. maculata (H.B. & K.) Steud.; see *G. sepium* (Jacq.) Kunth ex Walp.

G. sepium (Jacq.) Kunth ex Walp. syn *G. maculata* (H.B. & K.) Steud.

Kaempferol-3-O-rhamnoglucoside from leaves (*Curr. Sci.* 1966, 35, 364).

Distribution : Introduced from Central America, grown widely in Tamil Nadu, Karnataka, Maharashtra and Kerala upto 1000 m.

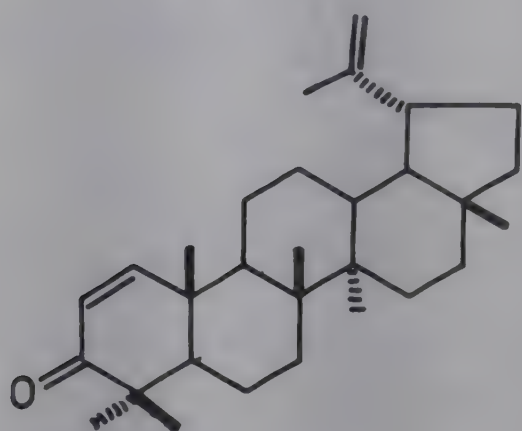
GLOCHIDION (Euphorbiaceae)

G. hohenackeri Bedd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New

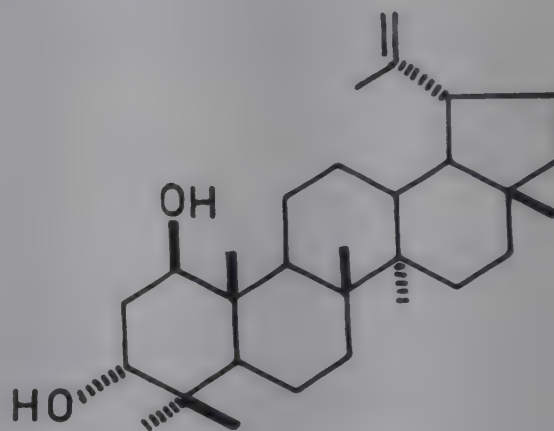
Delhi, 1956, p. 125).

Two new triterpenes - glochidone and glochidiol - along with 3-epilupeol isolated from bark and roots; their structures assigned (*Tetrahedron* 1966, 22, 1513).

NEW COMPOUNDS



Glochidone



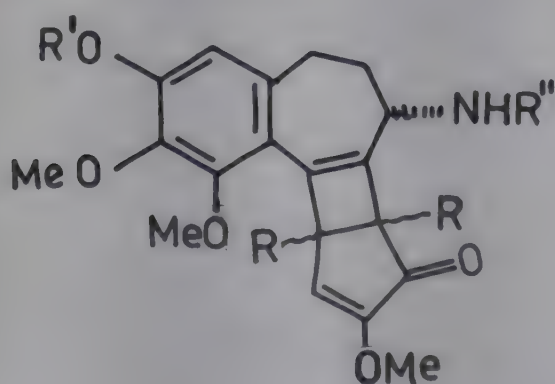
Glochidiol

GLORIOSA (Liliaceae)

G. superba L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 125).

Colchicine and related alkaloids identified in bulbs and seeds by PC (*Planta Med.* 1959, 7, 298); new alkaloids - O²-demethyl-N-formyldeacetylcolchicine, N-formyldeacetyl- β -lumicolchicine, O²-demethyl-N-formyldeacetyl- β -lumicolchicine, O²-demethyl- β -lumicolchicine and N-formyldeacetyl- γ -lumicolchicine isolated (*Chim. Ind. Milan* 1967, 49, 1304; *Chem. Abstr.* 1968, 68, 87424 s).

NEW COMPOUNDS



N-formyldeacetyl- β -lumicolchicine

R = β -H, R' = Me, R'' = CHO

O²-Demethyl-N-formyldeacetyl- β -lumicolchicine

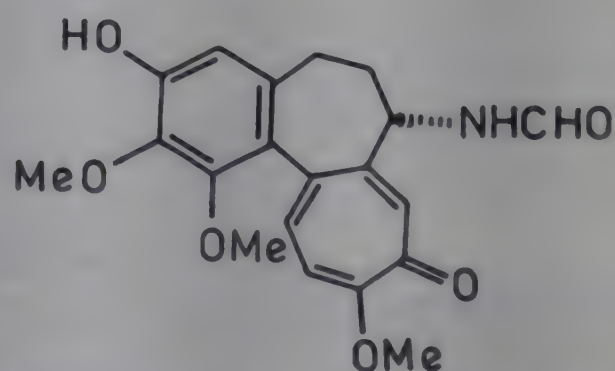
R = β -H, R' = H, R'' = CHO

O²-Demethyl- β -lumicolchicine

R = β -H, R' = H, R'' = Ac

N-formyldeacetyl- γ -lumicolchicine

R = α -H, R' = Me, R'' = CHO



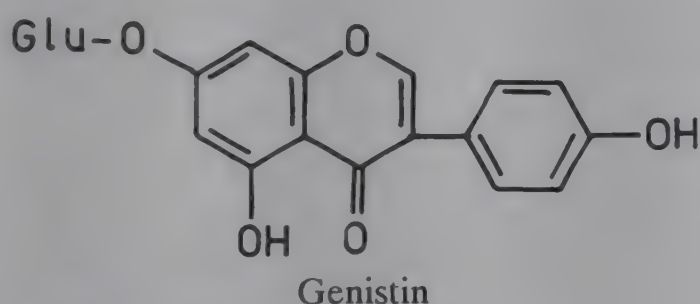
O²-Demethyl-N-formyldeacetylcolchicine

GLYCINE (Papilionaceae)

G. max (L.) Merr. syn. *G. soja* sensu Hook.f. (Non. sieb. & Zuss.), *Soja hispida* Moench. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 126).

Plant found to have marked hypoglycaemic and hypocholesterolaemic effects in normal rats (*Indian J. Med. Res.* 1968, 56, 1808).

New synthesis of flavonoid - daidzein (*Magy. Kem. Foly.* 1959, 65, 94; *Chem. Abstr.* 1960, 54, 14238 a); an isoflavone glycoside (0.01%) isolated from roots and identified as genistin (*Chem. Ber.* 1943, 76, 1110; *J. Taiwan Pharm. Assoc.* 1960, 12, 87; *Chem. Abstr.* 1961, 55, 25935 b); two galactomannans isolated from soyabean hulls (*J. Chem. Soc.* 1964, 5058).

NEW COMPOUNDS

G. soja Sieb. & Zucc.; see *G. max* (L.) Merr.

GLYCOSMIS (Rutaceae)

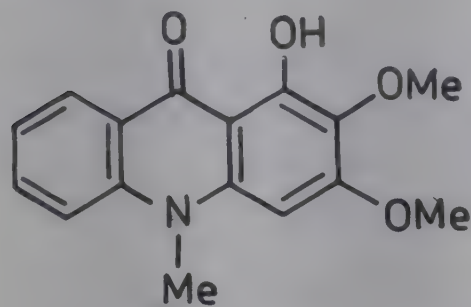
G. arborea (Roxb.) DC.; see *G. pentaphylla* (Retz.) DC.

G. pentaphylla (Retz.) DC. syn. *G. arborea* (Roxb.) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 126).

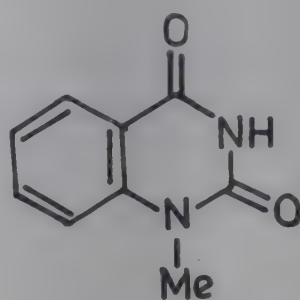
Presence of dictamnine, γ -fagarine, mp. 142°, skimmianine, mp. 176°, β -sitosterol and a coumarin in roots (*Trans. Bose. Res. Inst. Calcutta* 1961, 24, 121; *Chem. Abstr.* 1962, 56, 14394 i); isolation of stigmasterol, myricyl alcohol, a new base - glyborine (0.004%) - two new triterpenes - arborinol A, mp. 270°, (0.022%) and arborinol B (0.003%) (*J. Sci. Ind. Res.* 1961, 20B, 186); structure of arborine (glycosine) elucidated as 2-benzyl-1-methyl-4-quinazolone (*Tetrahedron* 1961, 16, 224); structure of arborinine (0.1%), mp. 176°, confirmed as 2,3-dimethoxy-1-hydroxy-10-methylacridone (*Chem. Ind.* 1961, 464; *Tetrahedron* 1961, 16, 251); three new quinazolone bases - glycosminine (glycosmine), mp. 249°, glycorine HCl, mp. 242°, glycosmicine, mp. 265° - and also γ -fagarine and skimmianine isolated from leaves and their structures described (*J. Sci. Ind. Res.* 1962, 21B, 49; *Ann. Biochem. Exp. Med.* 1963, 23, 123; *Chem. Abstr.* 1963, 59, 10466 h); two new epimeric pentacyclic triterpenes - arborinol, mp. 274° and isoarborinol, mp. 294° - isolated from leaves and their structures determined (*Ann. Chem.* 1963, 668, 57; *J. Indian Chem. Soc.* 1964, 41, 651); structures of glycosmicine, glycorine and glycosminine elucidated (*Tetrahedron* 1963, 19, 1011); complete structure of arborinol by X-ray crystallography (*Tetrahedron Lett.* 1965, 3433; *Tetrahedron* 1967, 23, 131); three new acridone alkaloids - noracronycine, de-N-methylacronycine and de-N-methylnoracronycine - from root bark (*Tetrahedron* 1966, 22, 3245); arborinone, mp 216° (0.00028%), along with

arborinol and isoarborinol from leaves (*Indian J. Chem.* 1967, 5, 129); interrelationships among quinazalone alkaloids; demethylation of glycorine and arborine to 4-quinazalone and glycosminine respectively (*Tetrahedron* 1968, 24, 1).

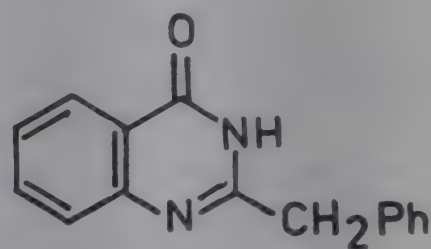
NEW COMPOUNDS



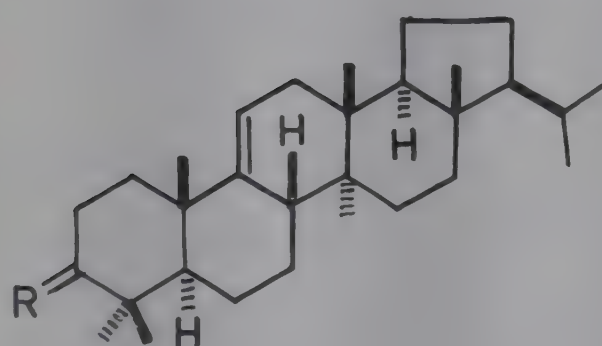
Arborinine



Glycosmicine



Glycosminine



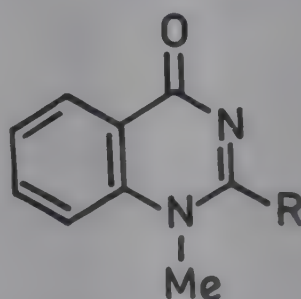
Arborinol

R = H, α -OH

Arborinone

R = O

Isoarborinol

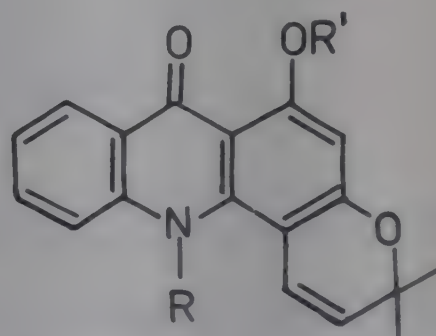
R = H, β -OH

Arborine

R = CH₂Ph

Glycorine

R = H



Noracronycine

R = Me, R' = H

de-N-Methylacronycine

R = H, R' = Me

de-N-Methylnoracronycine

R, R' = H

BIOLOGICAL ACTIVITY

Arborine (glycosine) in doses of 10-160 mg/kg, i.v., caused no mortality in mice except in 1 of 3 animals receiving 160 mg/kg; a dose of 80 mg/kg, i.p., caused death in 1 mouse and tremor in another. In rats doses upto 80 mg/kg, i.p., caused no mortality. In anaesthetised rats in situ, doses of 1-4 mg/kg, i.v. caused brief fall in blood pressure which was unaffected by atropine and/or mepyramine. In isolated rabbit duodenum, arborine in doses of above 10 μ g/ml caused increased peristalsis and mild contraction (*Bull. Calcutta Sch. Trop. Med.* 1960, 8, 102; *Chem. Abstr.* 1961, 55, 3822 a).

GLYCYRRHIZA (Papilionaceae)

G. glabra L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 126).

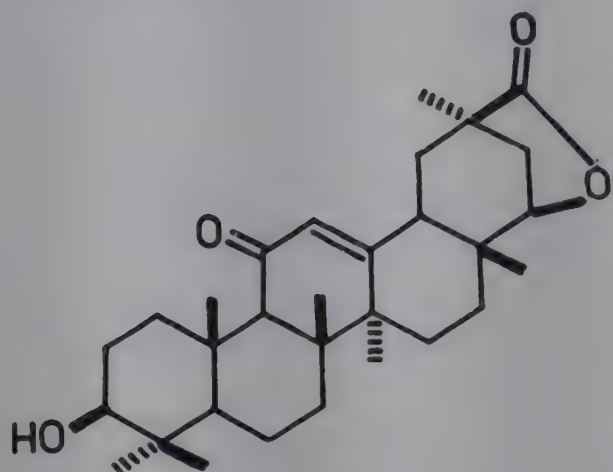
Alkaloidal fraction showed antiulcer activity in rats (*Chung-ang Uihak* 1969, 16, 515; *Chem. Abstr.* 1969, 71, 111219 p).

A flavanone rhamnoglucoside, mp. 132°, isolated from roots; used as smooth muscle

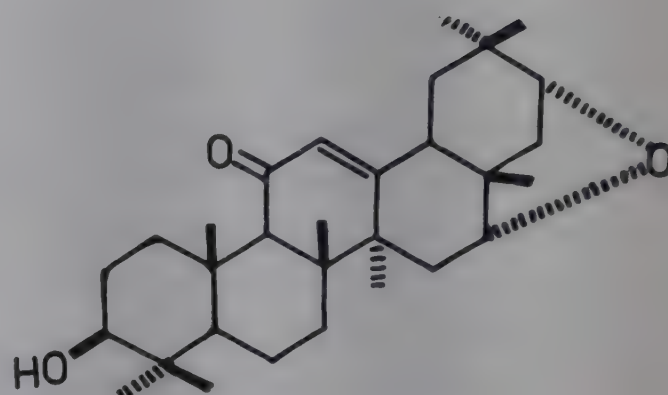
relaxant in pharmaceutical composition (Brit. 901,085 (1962) July 11; *Chem. Abstr.* 1962, 57, 11317 h); twenty seven flavonoids present in roots; of these six isolated and three identified as 4',7-dihydroxyflavanone (liquiritigenin), its 4'- β -D-glucoside (liquiritin) and 2,4',-trihydroxychalcone (isoliquiritigenin); other three are new flavonoids, - L-1, mp. 164°, L-5, mp. 150°, L-7, mp. 142° (*Zh. Obshch. Khim.* 1963, 33, 296; *Chem. Abstr.* 1963, 59, 1744 b); aglycones (90%) obtained by hydrolysis of flavonoid L-1, separated into liquiritigenin, mp. 207° and isoliquiritigenin, mp. 198° (*Zh. Obshch. Khim.* 1963, 33, 4014; *Chem. Abstr.* 1964, 60, 9347 g); two new chalcone glucosides characterised as trans-isoliquiritigenin-4'- β -D-glucopyranoside (isoliquiritin), mp. 187°, and trans-isoliquiritigenin-4- β -D-glucopyranoside (neisoliquiritin), mp. 230° (*Dokl. Akad. Nauk SSSR* 1964, 155, 600; *Chem. Abstr.* 1964, 60, 14579 e); liquiritigenin, liquiritin and isoliquiritigenin detected by PC (*Deut. Apoth. Ztg.* 1965, 105, 644; *Chem. Abstr.* 1965, 63, 6784 b); 7-hydroxy-4'-methoxyisoflavone (formonetin) from roots (*Experientia* 1966, 22, 359); a new flavonoid glycoside - licuraside, mp. 150° - characterised as trans-isoliquiritigenin-4-O-(-O- β -D-glucopyranosyl-2- β -D-apiofuranoside) (*Dokl. Akad. Nauk SSSR* 1966, 169, 347; *Chem. Abstr.* 1966, 65, 13811 d); ten flavonoids identified in plant by PC and saponaretin (isovitexin) characterised (*Khim. Priir. Soedin.* 1967, 3, 56; *Chem. Abstr.* 1967, 67, 112930 x); isolation and structure of new flavonone glycoside - rhamnoliquiritin (*Pharm. Tijdschr. Belg.* 1968, 45, 137; *Chem. Abstr.* 1969, 70, 106822 e).

A new triterpenoid - liquoric acid - isolated from roots, its structure elucidated (*Tetrahedron* 1965, 21, 2109); isolation of two triterpenoid acids-11-deoxoglycyrrhetic acid and liquiritic acid, mp. 298°, characterised as C-20 epimer of glycyrrhetic acid (*Gazz. Chim. Ital.* 1966, 96, 833; *Chem. Abstr.* 1966, 65, 15435 f); structure of isoglabrolide, mp. 318° (*Gazz. Chim. Ital.* 1966, 96, 843; *Chem. Abstr.* 1966, 65, 15436 c); new lactones - glabrolide, mp. 360°, deoxoglabrolide, mp. 274° and isoglabrolide - obtained from acid hydrolysate of crude glucosides (*Gazz. Chim. Ital.* 1966, 96, 772; *Chem. Abstr.* 1966, 65, 15435 b); glycyrrhizic acid isolated from rhizomes and roots (*Vop. Izuch. Ispolz. Solodki SSSR* 1966, 123; *Chem. Abstr.* 1968, 68, 66396 u); isolation of glycyrrhetol, mp. 304° and 21 α -hydroxy-isoglabrolide and their structures elucidated (*Gazz. Chim. Ital.* 1967, 97, 1347; *Chem. Abstr.* 1968, 68, 49810 g); synthesis of glycyrrhizic acid derivatives (*Zh. Obshch. Khim.* 1967, 37, 329; *Chem. Abstr.* 1968, 68, 13202 w); 18 α -hydroxyglycyrrhetic acid isolated from acid fraction of plant extract (*Gazz. Chim. Ital.* 1967, 97, 769; *Chem. Abstr.* 1968, 68, 13206 a); 24-hydroxy-11-deoxyglycyrrhetic and 24-hydroxyglycyrrhetic acids isolated as their Me esters (*Gazz. Chim. Ital.* 1967, 97, 1359; *Chem. Abstr.* 1968, 68, 49811 h); structures of 24-hydroxyliquiritic and liquiridolic acids determined (*Gazz. Chim. Ital.* 1968, 98, 712; *Chem. Abstr.* 1968, 59439 c); preparation of Me glabrate from Me glycyrrhetate (*Acta Chim.* 1968, 58, 75; *Chem. Abstr.* 1969, 70, 29115 x).

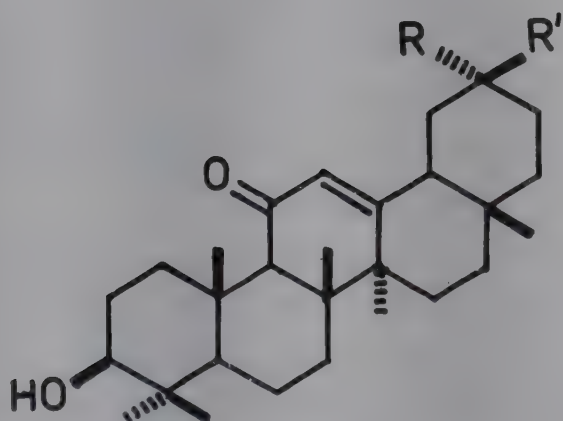
NEW COMPOUNDS



Glabrolide



Liquoric acid

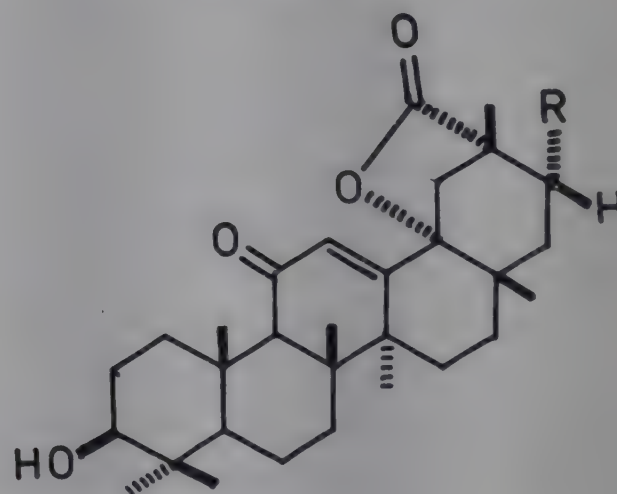


Glycyrrhetol

R = Me, R' = CH₂OH

Liquiritic acid

R = COOH, R' = Me

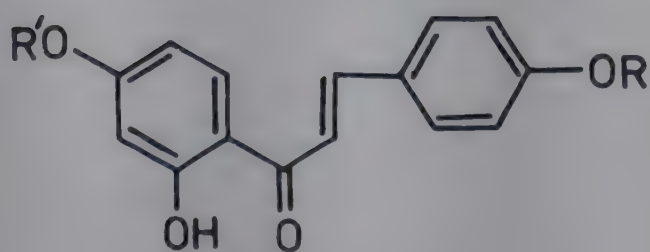


Isoglabrolide

R = H

21 α -Hydroxyisoglabrolide

R = OH



Isoliquirigenin

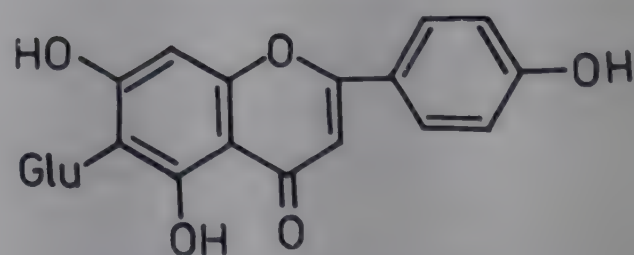
R, R' = H

Isoliquiritin

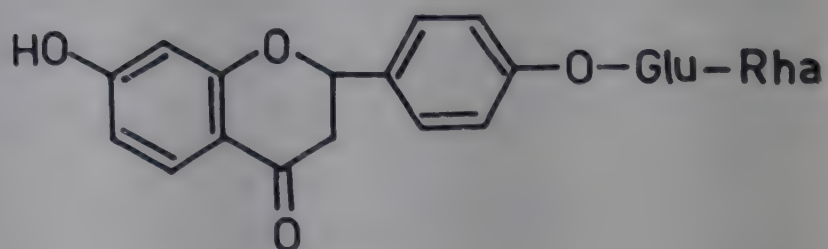
R = H, R' = Glu

Neoisoliquiritin

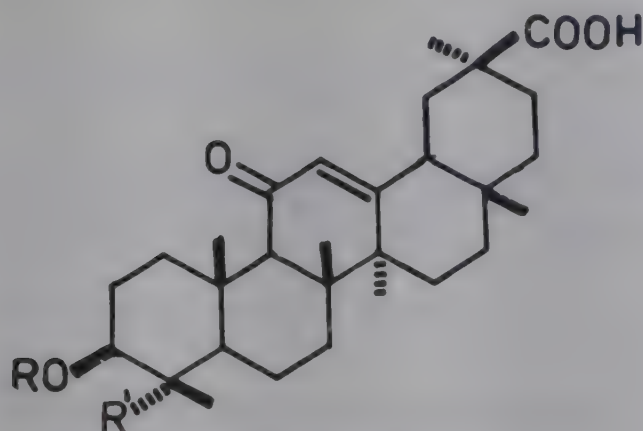
R = Glu, R' = H



Saponaretin



Rhamnoliquiritin



Glycyrrhetic acid

R = H, R' = Me, 18 α -H

24-Hydroxyglycyrrhetic acid

R = H, R' = CH₂OH, 18 α -H,

Glycyrrhetinic acid

R = H, R' = Me, 18 β -H

Glycyrrhizic acid

R = Gluc.acid(2 \rightarrow 1)Glu, R' = Me, 18 β -H

BIOLOGICAL ACTIVITY

A therapeutically active substance from roots lowered the blood pressure and roused rats in barbiturate narcosis (Ger. 1070780 (1959) Dec. 10.; *Chem. Abstr.* 1962, 56, 15617 e).

Spasmolytic activity of glycyrrhizin (8%) was 1/500 that of papaverine (*Diss. Pharm.* 1960, 12, 35; *Chem. Abstr.* 1964, 60, 10475 h); glycyrrhizin showed significant antidiuretic effect in rats and rabbits, i.p. or orally, but crude plant extract did not show significant effect in human volunteers even in high doses (20 g) (*Indian J. Med. Sci.* 1961, 15, 769); a flavanone rhamnoglucoside used as a depressor of smooth muscle fibres in pharmaceutical compositions (Brit. 901,085, (1962) July, 11; *Chem. Abstr.* 1962, 57, 11317 h); LD₅₀ s.c. of glycyrrhizin and glycyrrhizin-thiamine HCl in rats was 1.94 and 0.764 g/kg respectively. Both substances when pre-administered in doses of 0.3-0.1 mg/kg significantly prolonged survival time of rats which had received a lethal dose of strychnine, shikimin, toxopyrimidine, nicotine, caffeine or arsenobenzene (*Shikoku Igaku Zasshi* 1962, 18, 301; *Chem. Abstr.* 1963, 58, 6110 c); three flavonoids isolated, one was highly estrogenic while other two were nonestrogenic (*Zentralbl. Veterinaarmed.*, Reihe A 1964, 11, 773; *Chem. Abstr.* 1965, 62, 9465 h).

Flavonoids - liquiritigenin, its glucoside, licurizid and liquiritone - administered internally to cats in X-ray experiments, inhibited passage of Ba suspension from stomach into intestine. In dogs, they inhibited evacuation of water from stomach into duodenum (*Vop. Izuch. Isopol'z. Solodki Nauka* 1966, 163; *Chem. Abstr.* 1967, 67, 107314 r).

GMELINA (Verbenaceae)

G. arborea Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 126).

Luteolin isolated from leaves (*Curr. Sci.* 1967, 36, 71).

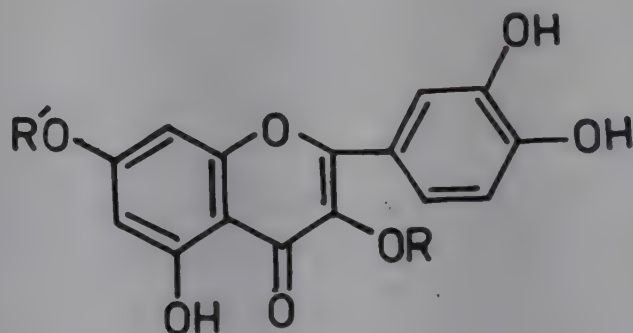
GOSSYPIUM (Malvaceae)

G. barbadense L. emend. Hutch. et al. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 127).

Quercimeritrin, mp. 246° , quercetin-3-sophoroside, mp. 203° , and two other flavonols present in flowers (*Dokl. Akad. Nauk Uz. SSR* 1964, 21, 30; *Chem. Abstr.* 1965, 62, 9457 d).

G. hirsutum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 127).

Quercimeritrin isolated from flowers (*Dokl. Akad. Nauk Uz. SSR* 1962, 19, 34; *Chem. Abstr.* 1963, 59, 2756 c; *Khim. Prir. Soedin.* 1965, 1, 67; *Chem. Abstr.* 1965, 63, 2123 d); a new glycoside - hirsutrin, mp. 220° - characterised as quercetin-3- β -D-glucopyranoside (*Khim. Prir. Soedin.* 1967, 3, 98; *Chem. Abstr.* 1967, 67, 44050 d); chrysanthemins (3- β -D-glucoside of cyanidin) from buds and flowers (*Phytochemistry* 1967, 6, 1165).

NEW COMPOUNDS

Hirsutrin

R = Glu, R' = H

Quercimeritrin

R = H, R' = Glu.

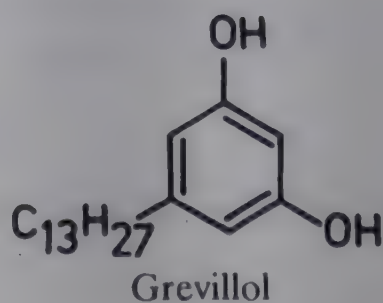
GREVILLEA (Proteaceae)

G. robusta A. Cunn. ex R. Br.

Eng. - Silver oak, Silky oak; Tam. - Savukkumaram.

Grevillol characterised as 5-tridecylresorcinol, mp. 82° , and sitosterol isolated from wood (*Aust. J. Chem.* 1965, 18, 2015).

Distribution : Native of Australia, planted in India in gardens and avenues and as a shade tree in tea and coffee plantations.

NEW COMPOUNDS

Grevillol

GREWIA (Tiliaceae)

G. asiatica L.; see *G. subinaequalis* DC.

G. subinaequalis DC. syn. *G. asiatica* sensu Hook.f. p.p. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 128).

Physical characteristics of seed oil described (*Pakistan J. Sci. Ind. Res.* 1964, 7, 145; *Chem. Abstr.* 1965, 62, 8118 h).

GUAIACUM (Zygophyllaceae)

G. officinale L.

Eng. - Gum guaiacum, Brazil wood; Trade - Lignum vitae.

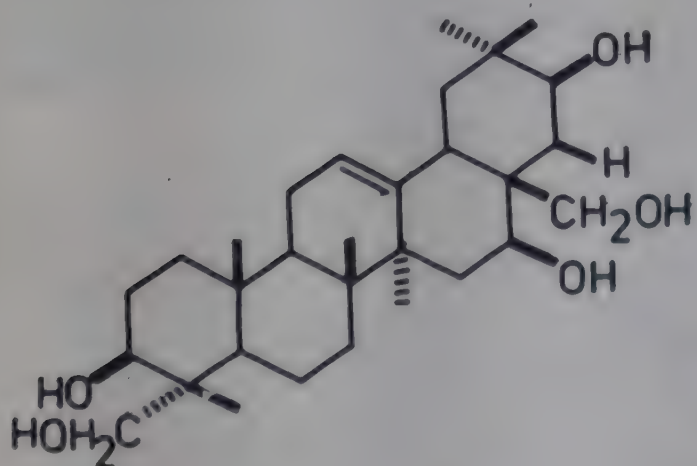
Alkaloids free of harman, harmine and harmol obtained from wood (*Diss. Pharm.* 1963, 15, 281; *Chem. Abstr.* 1964, 61, 2904 b); new furanolignans - furoguaiacin and O-methyl-furoguaiacin - isolated from heartwood, their synthesis described (*J. Chem. Soc.* 1965, 1572).

Distribution : Native of tropical America, grown in Indian gardens.

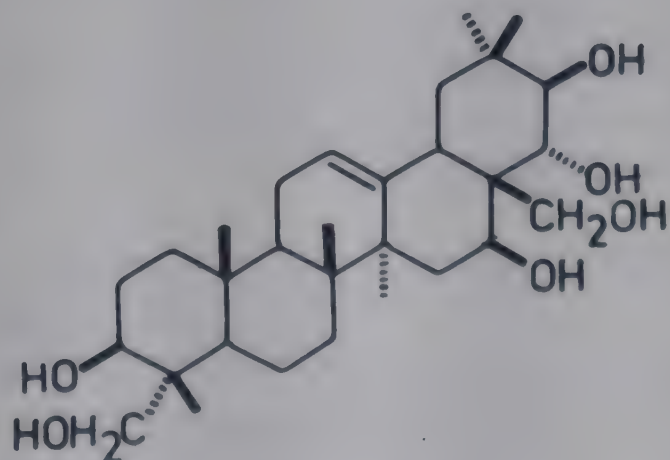
GYMNEMA (Asclepiadaceae)

G. sylvestre (Retz.) Schult. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 129).

Chemical investigation of leaves (*Diss. Abstr.* 1964, 25, 1592; *Chem. Abstr.* 1965, 62, 3057 d); nonacosane, hentriacontane and triacontane isolated by VPC from hydrocarbon fraction of leaf extract (*J. Pharm. Sci.* 1965, 54, 1541); antisaccharin principle - gymnemic acid - characterised as β -glucuronide of a new hexahydroxy-olean-12-ene, mp. 328° (*Helv. Chim. Acta* 1967, 50, 474); structure of new triterpene - gymnestrogenin - from leaves proposed as $3\beta, 16\beta, 21\beta, 23, 28$ -pentahydroxyolean-12-ene (*Helv. Chim. Acta* 1968, 51, 1235); gymnemagenin from leaves characterised as $3\beta, 16\beta, 21\beta, 22\alpha, 23, 28$ -hexahydroxyolean-12-ene (*Helv. Chim. Acta* 1969, 52, 365).

NEW COMPOUNDS

Gymnestrogenin



Gymnemagenin

GYNANDROPSIS (Capparaceae)

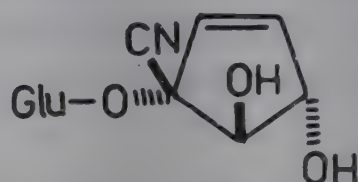
G. gynandra (L.) Briq.; see *Cleome gynandra* L.

G. pentaphylla (L.) DC.; see *Cleome gynandra* L.

GYNOCARDIA (Flacourtiaceae)

G. odorata R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 129).

Gynocardin (6.8%) isolated from defatted seeds and its structure assigned (*J. Org. Chem.* 1966, 31, 4312); crystal structure of gynocardin (*Chem. Commun.* 1970, 381).

NEW COMPOUNDS

Gynocardin

HAEMANTHUS (Amaryllidaceae)

H. multiflorus Martyn

Eng. - Painter's brush lily.

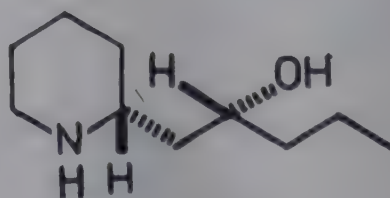
Alkaloids - lycorine and montanine - found to be present but haemultine, previously reported, not detected; chemical studies on crinamine and haemanthamine (*J. Org. Chem.* 1961, 26, 1617).

Distribution : Native of Africa, grown in Indian gardens.

HALOXYLON (Chenopodiaceae)

H. salicornicum (Miq.) Bunge ex Boiss. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 130).

Aldotripiperidine, haloxine and halosaline isolated (*Acta Pharm. Suec.* 1967, 4, 97; *Chem. Abstr.* 1967, 67, 40992 q); in addition tyramine, N-methyltyramine and three unidentified amines isolated from plant extract (*Acta Pharm. Suec.* 1968, 5, 67; *Chem. Abstr.* 1968, 69, 25044 e); absolute configuration of halosaline (*Acta Chem. Scand.* 1969, 23, 3479).

NEW COMPOUNDS

Halosaline

HARDWICKIA (Papilionaceae)

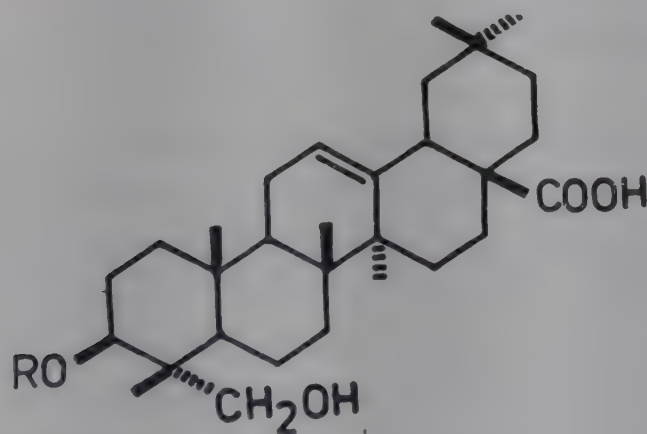
H. pinnata Roxb.; see *Kingiodendron pinnatum* (Roxb. ex DC.) Harms.

HEDERA (Araliaceae)

H. helix L.; see *H. nepalensis* K. Koch

H. nepalensis K. Koch syn. *H. helix* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 130).

Rutin, kaempferol-3-glucoside, coumaric acid, ferulic acid, chlorogenic acid and scopoline from bark (*C. R. Acad. Sci. Paris, Ser. D.* 1964, 258, 2390; *Chem. Abstr.* 1964, 60, 13574 d); α -hederin, mp. 256°, isolated from leaves (*Naturforsch.* 1965, 20B, 708; *Chem. Abstr.* 1965, 63, 18178 b).

NEW COMPOUNDS

α -Hederin

R = Ara(2→1)Rha

HEDYCHIUM (Zingiberaceae)

H. coronarium Koen.

Eng. - Common ginger lily, Garland flower.

Essential oil (0.1%) from rhizomes, contained eucalyptol (*Anais Assoc. Brasil. Quim.* 1959, 18, 179; *Chem. Abstr.* 1960, 54, 11386 h).

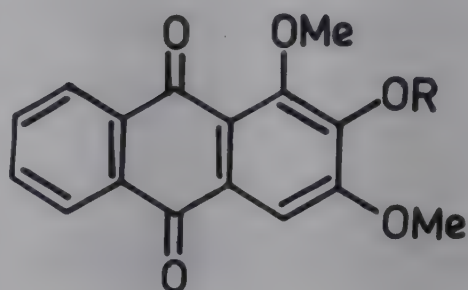
Distribution : Throughout moist parts of India upto 2400 m. in Himalayas and other hills; also grown in gardens.

HEDYOTIS (Rubiaceae)

H. diffusa Willd. syn. *Oldenlandia diffusa* (Willd.) Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 180).

1,2,3-Trimethoxyanthraquinone (I), mp. 164°, 2-hydroxy-1,3-dimethoxyanthraquinone, mp. 212°, its 2-O-glucoside (II), mp. 202°, 3-hydroxy-1,2-dimethoxyanthraquinone, mp. 225° and alizarin-1-methyl ether, mp. 179°, isolated (*Leather Sci.* 1968, 15, 49; *Chem. Abstr.* 1968, 69, 5172 s).

NEW COMPOUNDS



I

R = Me

II

R = Glu

HELIANTHUS (Asteraceae)

H. annuus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 131).

Echinocystic acid, mp. 294°, identified in aglycone mixture from saponin of petals (*Rocz. Chem.* 1962, 36, 1615; *Chem. Abstr.* 1963, 59, 10137 e); arabinose, glucose, rhamnose, xylose, and oleanolic, albigenic and echinocystic acids identified in hydrolysates of saponins (*Bull. Acad. Pol. Sci., Ser. Sci. Biol.* 1966, 14, 747; *Chem. Abstr.* 1967, 66, 105156 w); three saponins - helianthosides A, B and C - found; helianthoside C, mp. 215°, isolated (*Khim. Prir. Soedin.* 1968, 4, 140; *Chem. Abstr.* 1968, 69, 41756 r); total sterols in flowers estimated as 0.08%; of these 7-ene and 22-ene sterols constitute 7.0 and 63.0% respectively (*Rocz. Chem.* 1967, 41, 201; *Chem. Abstr.* 1967, 67, 784 s).

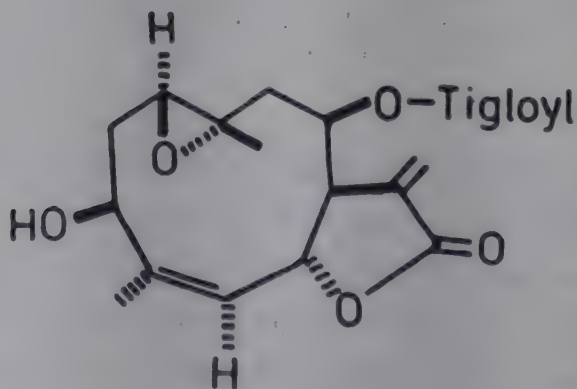
H. tuberosus L.

H. - Hathichuk; B. - Brahrookha.

Isolation and structure of heliangine, mp. 213° (*Agric. Biol. Chem.* 1966, 30, 1152; *Chem. Abstr.* 1967, 66, 65654 y; *Tetrahedron* 1966, 22, 3173; *Chem. Commun.* 1972, 140).

Distribution : Native of North America. It is reported to have been introduced in Bengal, Assam, Maharashtra, Uttar Pradesh and Andhra Pradesh.

NEW COMPOUNDS

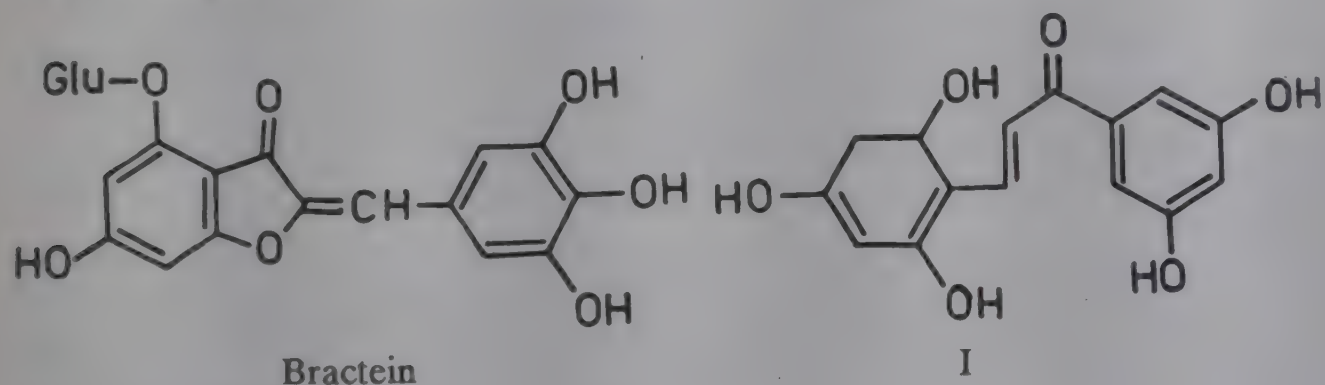


Heliangine

HELICHRYSUM (Asteraceae)***H. bracteatum* Andr.**

An aurone glucoside - bractein (0.02%) - isolated from buds; on hydrolysis gave glucose and bracteatin, mp. 350° (*Tetrahedron Lett.* 1962, 599); structure elucidation and synthesis of bractein (*Chem. Ber.* 1965, 98, 2930); 3,4,2',4',6'-pentahydroxychalcone (I) from petals (*Curr. Sci.* 1966, 35, 609).

Distribution : Native of Australia, grown as ornamental plant in India.

NEW COMPOUNDS**HELIOTROPIUM** (Boraginaceae)

H. eichwaldi Steud. var. *lasiocarpum* (Fisch. & Mey.) C.B. Clarke; see *H. europaeum* L. var. *lasiocarpum* (Fisch. & Mey.) Kazmi.

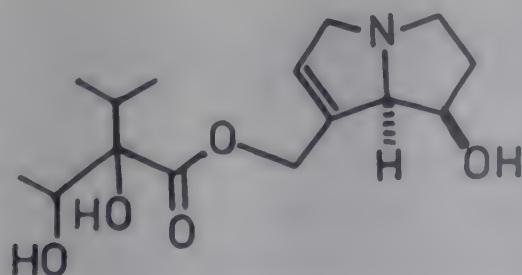
H. europaeum L. var. *lasiocarpum* (Fisch. & Mey.) Kazmi syn. *H. eichwaldi* Steud. var. *lasiocarpum* (Fisch. & May.) C. B. Clarke, *H. lasiocarpum* Fisch. & Mey.

Linoleic acid, linolenic acid, heliotropin, heliotrine and lasiocarpine isolated (*Uzb. Khim. Zh.* 1965, 9, 35; *Chem. Abstr.* 1965, 65, 11884 c).

Distribution : North-west India and Kashmir, alt. 1600 m.

H. indicum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 13).

Indicine, acetylindicine, indicinine and an ester of retronecine with an unidentified acid isolated (*J. Chem. Soc. C* 1967, 329).

NEW COMPOUNDS

Indicine

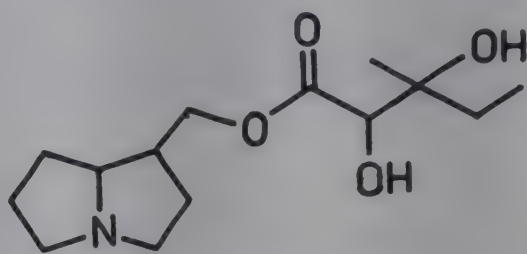
H. lasiocarpum Fisch & Mey.; see *H. europaeum* L. var. *lasiocarpum* (Fisch. & Mey.) Kazmi

H. strigosum Willd.

H. - Arkali, Jhunkri, Chitiphul; Mar. - Sanjuvanchivel; P. - Kharai.

A new pyrrolizidine alkaloid - strigosine - isolated (*J. Chem. Soc.* 1964, 1974).

Distribution : Throughout Indian plains.

NEW COMPOUNDS

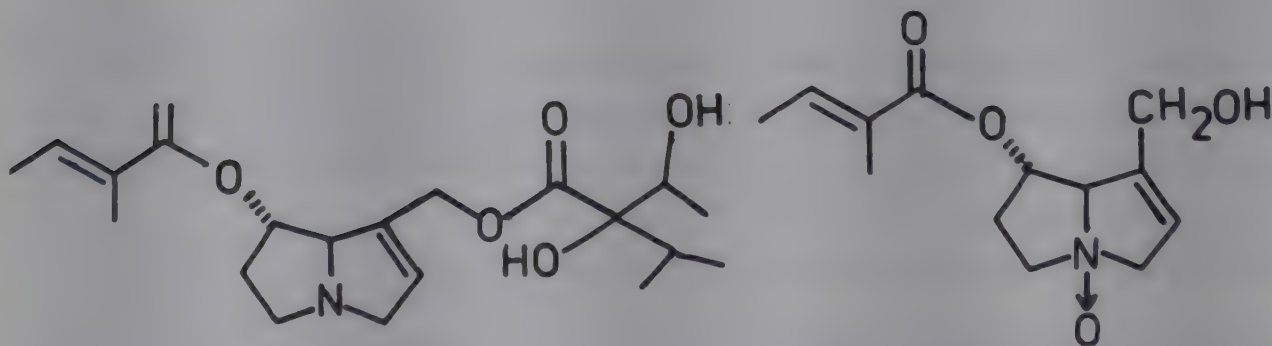
Strigosine

H. supinum L.

H. - Talab-buti.

Three pyrrolizidine alkaloids - supinine, heliosupine and echinatine - isolated; two minor alkaloids could not be separated but were shown by hydrogenolysis to be viridifloric acid esters of 7-angelylheliotridine (I), mp. 116°; N-oxide of 7-angelylheliotridine also isolated (*Aust. J. Chem.* 1959, 12, 694).

Distribution : Plains of Maharashtra, Gujrat, Uttar Pradesh, Punjab and Rajasthan.

NEW COMPOUNDS

I

7-Angelylheliotridine N-oxide

HELLEBORUS (Ranunculaceae)

H. niger L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 131).

An improved method for isolation of steroidal glycoside - helebrigenin, mp. 235° - from plant (Ger. 1,176,794 (1964) Aug. 27; *Chem. Abstr.* 1965, 62, 407 b).

HEMIDESMUS (Asclepiadaceae)

H. indicus (L.) R.Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 132).

Rutin from leaves (*Phytochemistry* 1968, 7, 1703).

HERACLEUM (Apiaceae)

H. candicans Wall. ex DC.; see *H. lanatum* Michx.

H. concanense Dalz.

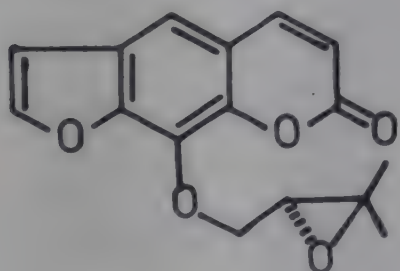
Bergapten and isopimpinellin from fruits (*Ann. Biochem. Exp. Med.* 1959, 19, 181; *Chem. Abstr.* 1960, 54, 13291 b).

Distribution : Western Ghats.

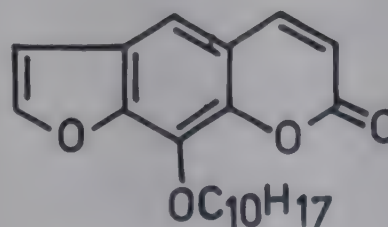
H. lanatum Michx. syn. *H. candicans* Wall. ex DC.

Two lactones, mp. 85° and 108° and bergapten, mp. 190°, from fruits (*Indian J. Pharm.* 1961, 23, 303); α -pinene (12.6), β -pinene (30.5), carveol acetate (17.1), dihydrocarveol (19.6), phenylpropionaldehyde (2.53) and phenyl ethyl acetate (2.9%) from essential oil of roots (*Riechstoffe Aromen* 1963, 13, 325; *Chem. Abstr.* 1965, 62, 6335 g); a new furocoumarin - heraclenol - isolated and characterised as 8-(β,γ -dihydroxyisoamyloxy)-psoralen (*Naturwiss.* 1964, 51, 537; *Chem. Abstr.* 1965, 62, 4324 c); presence of imperatorin oxide in roots (*Zh. Obsch. Khim.* 1965, 35, 403; *Chem. Abstr.* 1965, 62, 15072 a); another new furocoumarin - heraclenin, mp. 111° - from roots (*Tetrahedron* 1964, 20, 87); 8-geranoxypsoralen isolated, structure elucidated and synthesised (*Tetrahedron* 1966, 22, 3221); absolute configuration of heraclenin (*Acta Chem. Scand.* 1969, 23, 962).

Distribution : Kashmir to Kumaon, 2000-4000 m.

NEW COMPOUNDS

Heraclenin



8-Geranoxypsoralen

BIOLOGICAL ACTIVITY

Heraclenin showed skin photosensitising activity (*Tetrahedron* 1964, 20, 87).

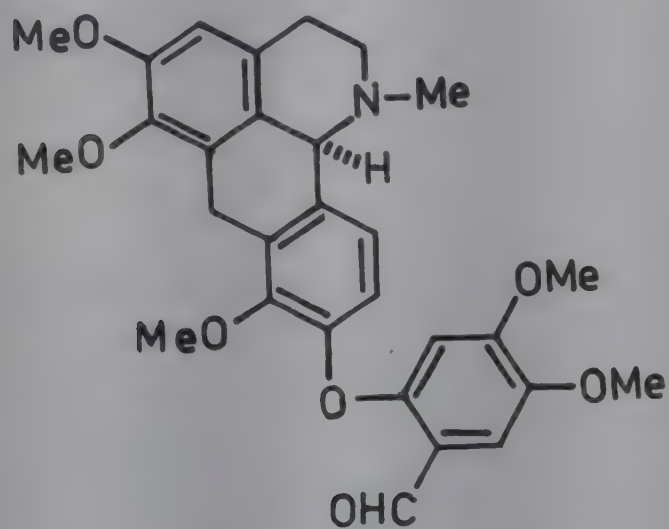
HERNANDIA (Hernandiaceae)

H. ovigera L. syn. *H. peltata* Meissn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 132).

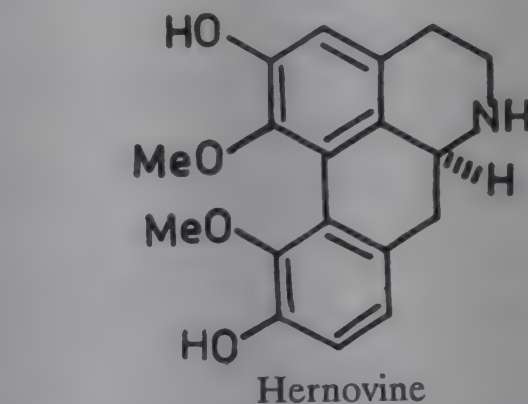
Five new aporphines isolated from bark and characterised as nandigerine, mp. 176°, N-methylnandigerine, mp. 243°, ovigerine obtained as hydrochloride, mp. 300°, N-methylovigerine, mp. 243° and hernovine, mp. 234°; in addition, isocorydine and thalicarpine isolated (*Tetrahedron Lett.* 1966, 1577); laurotetanine and a new base - hernandaline, mp. 170° - isolated and its structure proposed (*Tetrahedron Lett.* 1966, 4279); a novel alkaloid hernovine, mp. 143°, thalicarpine and xanthopanine iodide, mp. 213°, isolated from bark (*Tetrahedron Lett.* 1965, 4309; *Yakugaku Zasshi* 1966, 86, 763; *Chem. Abstr.* 1966, 65, 18635 b;

Chem. Pharm. Bull. 1967, 15, 959); hernangerine (nandigerine) and L-reticuline isolated (*Yakugaku Zasshi* 1966, 86, 1143; *Chem. Abstr.* 1967, 66, 85909 p).

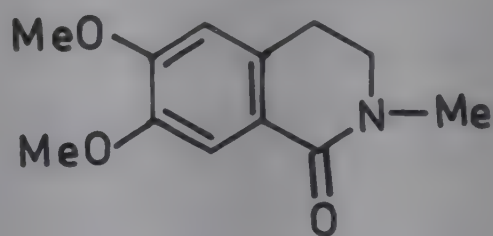
NEW COMPOUNDS



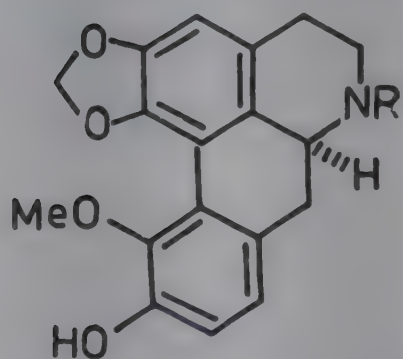
Hernandaline



Hernovine



Laurotetanine

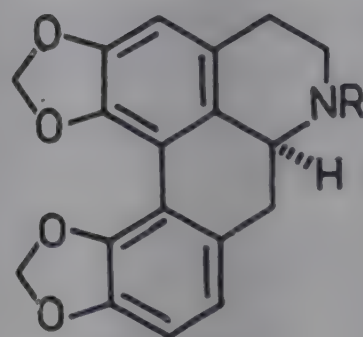


Nandigerine

R = H

N-Methylnandigerine

R = Me

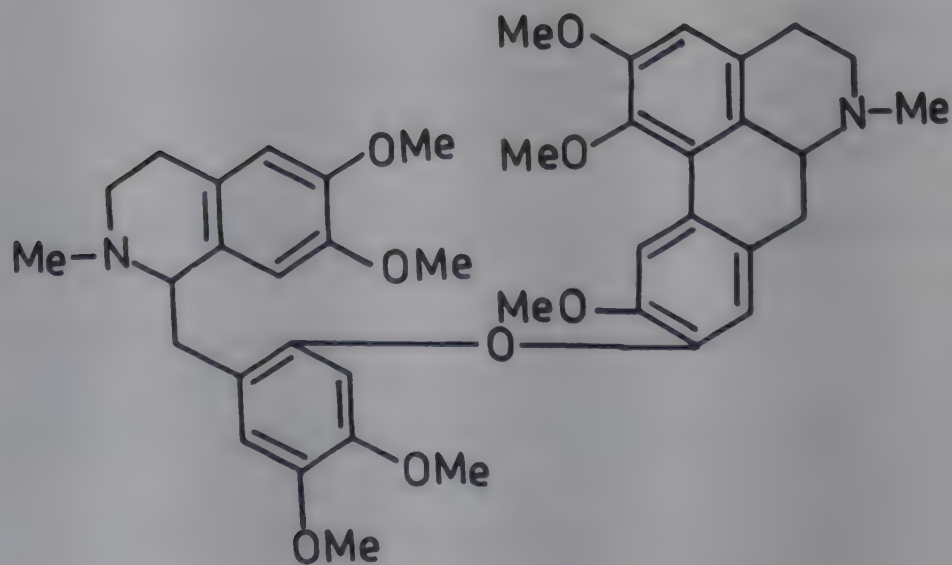


Ovigerine

R = H

N-Methylovigerine

R = Me



Thallicarpine

BIOLOGICAL ACTIVITY

Hernandaline is a useful hypotensive (U.S. 3,376,305 (1968) Apr. 2; *Chem. Abstr.* 1968, 69, 59474 k).

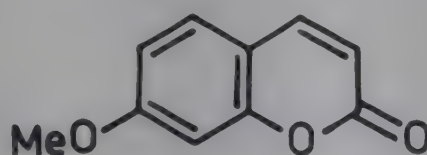
H. peltata Meissn.; see *H. ovigera* L.

HERNIARIA (Illecebraceae)

H. glabra L.

Umbelliferone, herniarin, isorhamnetin-3-rhamnoglucoside, rutin, isorhamnetin-3-triglycoside(rhamnose, glucose 1:2), quercetin-3-triglycoside(rhamnose,glucose), mp. 298° and a saponin quillaic acid isolated (*Naturwiss.* 1960, 47, 63; *Chem. Abstr.* 1960, 54, 19664 h); sugar component of saponins constituted of galacturonic acid, glucose, xylose, fucose, and rhamnose (*Biul. Inst. Roslin Lecznichych* 1963, 9, 12; *Chem. Abstr.* 1964, 60, 13094 f).

Distribution : Introduced into Indian gardens.

NEW COMPOUNDS

Herniarin

HERPESTIS (Scrophulariaceae)

H. monniera (L.) H.B. & K. see *Bacopa monnieri* (L.) Wettst.

HESPERIS (Brassicaceae)

H. matronalis L.

Strophanthidin boivinoside, strophanthidin glucoboivinoside and strophanthidin digitoxoside from seeds (*Diss. Pharm.* 1965, 17, 519; *Chem. Abstr.* 1966, 64, 18029 b); a new choline ester - hesperaline - isolated as iodide, mp. 182°, from seeds (*Arch. Pharm.* 1967, 300, 176; *Chem. Abstr.* 1967, 66, 102438 d).

Distribution : An introduced species, grown in hill gardens.

HETEROPHRAGMA (Bignoniaceae)

H. adenophyllum Seem. ex Benth, & Hook.f.; see *Fernandoa adenophylla* (Wall. ex. G. Don) V. Steenis

HEVEA (Euphorbiaceae)

H. brasiliensis (H.B. & K.) Muell-Arg.

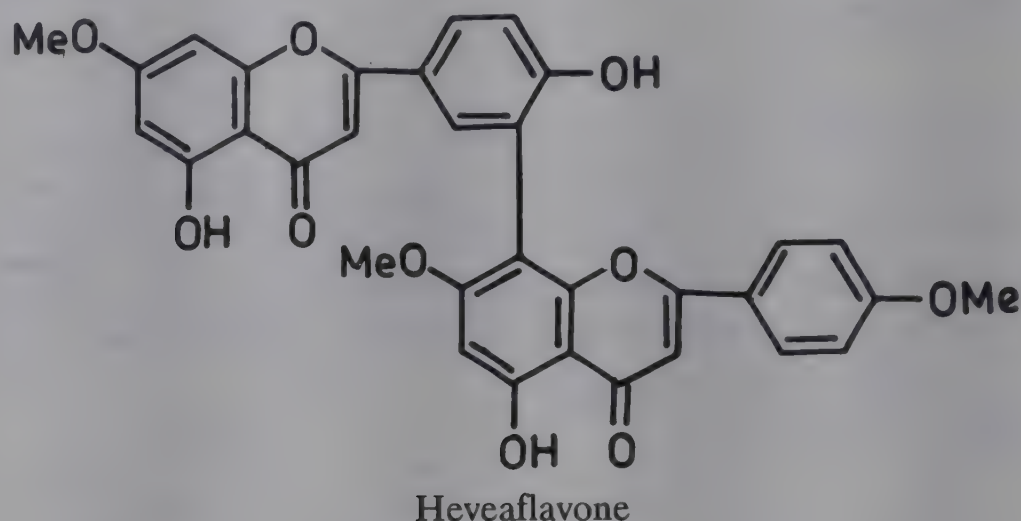
Eng. - Para rubber tree.

Presence of hexokinase and fructokinase in latex (*C.R. Acad. Sci. Paris, Ser. D* 1967, 265, 260; *Chem. Abstr.* 1967, 67, 114386 u); tyrosine and three betaines - trigonelline, ergothioneine

and hercynine - identified in readily sedimentable latex (*Phytochemistry* 1968, 7, 109); quercetin, kaempferol-O-glycoside and new biflavonoid - heveaflavone, mp. 305° - from leaves (*Tetrahedron Lett.* 1969, 2017).

Distribution : Introduced from Brazil. Plantations in south India and other regions.

NEW COMPOUNDS



HIBISCUS (Malvaceae)

H. abelmoschus L.; see *Abelmoschus moschatus* Medik.

H. cannabinus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 133).

Aldobiouronic acid, isolated after partial acid hydrolysis of hemicellulose, identified as 2-O-(4-O-methyl- α -D-glucopyranosyluronic acid)-D-xylopyranose (*Can. J. Chem.* 1962, 40, 572); rutin and isoquercitrin from leaves (*Z. Naturforsch.* 1964, 19, 857; *Chem. Abstr.* 1964, 61, 15041 c); total ash (8.1) and fatty oil (19.0%) from undecorticated seeds; palmitic, stearic, oleic and linoleic acids and β -sitosterol detected in unsaponifiable fraction by PC (*Planta Med.* 1964, 12, 513).

H. esculentus L.; see *Abelmoschus esculentus* (L.) Moench.

H. mutabilis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 133).

Quercimeritrin (quercetin-7-glucoside), meratrin (quercetin-3-diglucoside) and cyanin (cyanidin-3,5-diglucoside) identified in flowers (*Curr. Sci.* 1964, 33, 112).

H. rosa-sinensis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 133).

BIOLOGICAL ACTIVITY

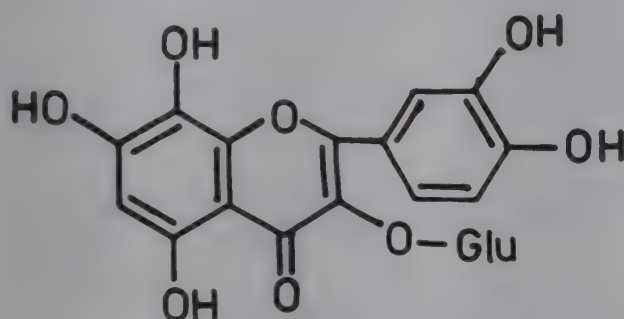
The glycosidic material at 40-80 mg/kg. i.v. exhibited hypotensive action in intact and spinal dogs which persisted for 1-2 hrs. It also showed antispasmodic action on isolated smooth muscles, apparently due to the presence of cholinergic and papaverine-like substances (*Indian J. Med. Res.* 1967, 55, 1007).

H. sabdariffa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 133).

Extract of flowers contained reducing sugars, glycosides, acids, an alkaloid and resins. It acted as antispasmodic in intestine and uterus muscle preparations. Decoction may be used as hypotensive agent since it lowered blood pressure without producing side-effects (*Planta Med.* 1962, 10, 48).

New glycoside - gossytrin, mp. 182° - isolated from flower petals and structure determined (*J. Indian Chem. Soc.* 1961, 38, 649).

NEW COMPOUNDS

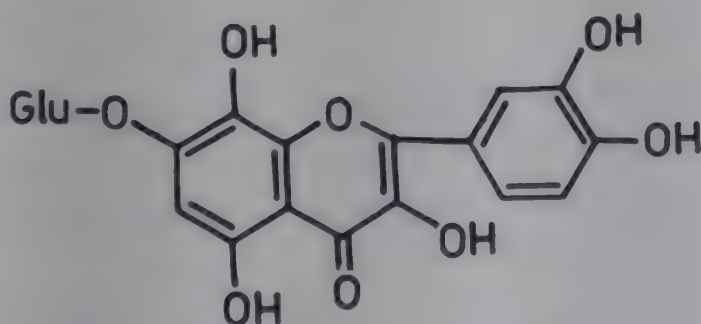


Gossytrin

H. tiliaceus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 134).

Gossypetin-3-glucoside (gossytrin) and 7-glucoside isolated from flowers and their structures elucidated (*J. Sci. Ind. Res.* 1961, 20B, 553).

NEW COMPOUNDS



Gossypetin-7-glucoside

H. trionum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 134).

Aerial parts used in popular medicine for their diuretic action (*Farmacia* 1962, 10, 651; *Chem. Abstr.* 1963, 58, 13726 a).

HIPPEASTRUM (Amaryllidaceae)

H. equestre Herb.; see *Amaryllis equestris* Ait.

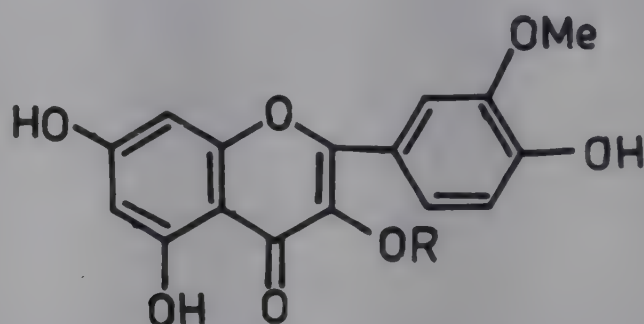
HIPPOPHAE (Elaeagnaceae)

H. rhamnoides L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi,

1956, p. 134).

Six flavonoids detected in extract of fresh berries by PC; two of these identified as isorhamnetin and kaempferol (*Kongr. Pharm. Wiss. Vortr. Originalmitt.* 23, Muenster, Ger. 1963, p. 175; *Chem. Abstr.* 1965, 62, 16630 g); isorhamnitol from fruits (*Farmacia* 1964, 12, 655; *Chem. Abstr.* 1965, 62, 7587 a); serotonin isolated from bark (*Zh. Prikl. Khim.* 1964, 37, 2763; *Chem. Abstr.* 1965, 62, 9466 b); isorhamnetin, its 3- β -D-glucoside and 3- β -rutinoside isolated from berries; three other flavonoids isolated as crystalline mixture, found to be oligosides (glucose, galactose, arabinose, xylose and rhamnose) of quercetin and kaempferol (*Lloydia* 1966, 29, 225); carboline alkaloids - harmolol, tetrahydroharman and harmine - from roots (*Herba Pol.* 1967, 13, 171; *Chem. Abstr.* 1968, 69, 49782 v).

NEW COMPOUNDS



Isorhamnetin glucoside

R = Glu

Isorhamnetin rutinoside

R = Rutinose

HIPTAGE (Malpighiaceae)

H. benghalensis (L.) Kurz syn. *H. madablota* Gaertn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 134).

Mangiferin isolated from root bark, identified as 1,3,6,7-tetrahydroxy-1-O- β -D-glucosyl-xanthone (*J. Pharm. Sci.* 1968, 57, 1039).

H. madablota Gaertn.; see *H. benghalensis* (L.) Kurz.

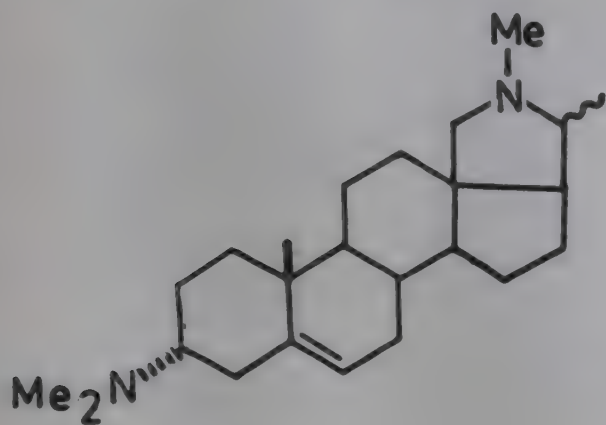
HOLARRHENA (Apocynaceae)

H. antidysenterica (Roth) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 134).

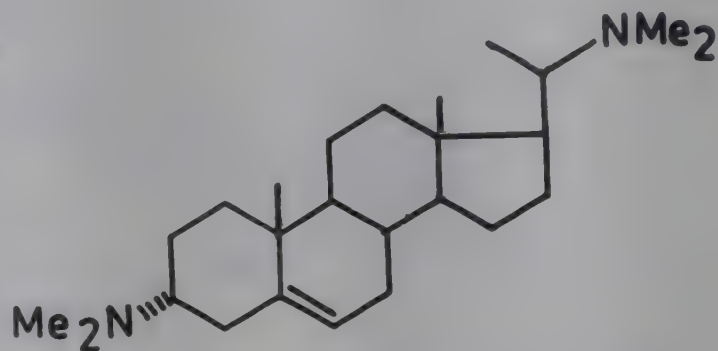
Synthesis of conessine from cholesteryl toluene p-sulfonate (*Proc. Chem. Soc.* 1961, 206; *Chem. Abstr.* 1962, 56, 3529 d); concuressine, mp. 86°, 3-epihetero-conessine, mp. 146°, and kurcholessine, mp. 219°, isolated after methylation of alkaloid mixture; structures of konkurchine (irehline) and kurchamine further substantiated by chemical studies; kurchimine also isolated (*Chem. Ber.* 1962, 95, 1144; *Collect. Czech. Chem. Commun.* 1963, 28, 2345; a new digitenol glycoside - holadysone, mp. 207° - characterised as 11 α ,20-dihydroxy-18,20-epoxypregna-1,4-dien-3-one (*Ann. Chem.* 1963, 670, 103; *Chem. Abstr.* 1964, 60, 8087 e);

kurcholessine isolated after methylation of total basic fraction and structure elucidated (*Tetrahedron Lett.* 1964, 1659); O-free alkaloids (conessine, conimine), conkurchine group alkaloids (including conessidine) and O-containing alkaloids (holarrhenine, holafrine, holar-rhetine) present in bark whereas leaves contain O-containing alkaloids (kurchiphyllamine and kurchiphylline) (*Quart. J. Crude Drug Res.* 1968, 8, 1141).

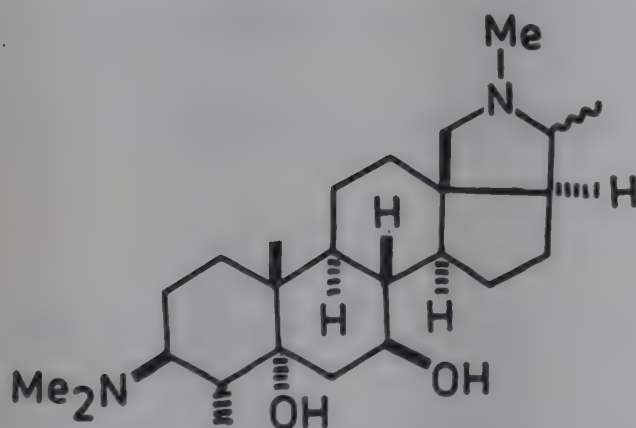
NEW COMPOUNDS



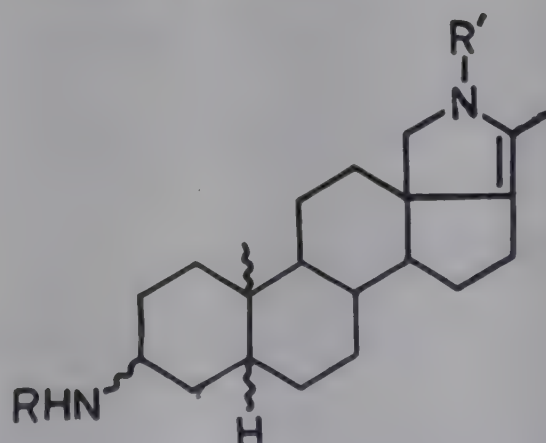
Concuressine



3-Epihetero-conessine



Kurcholessine

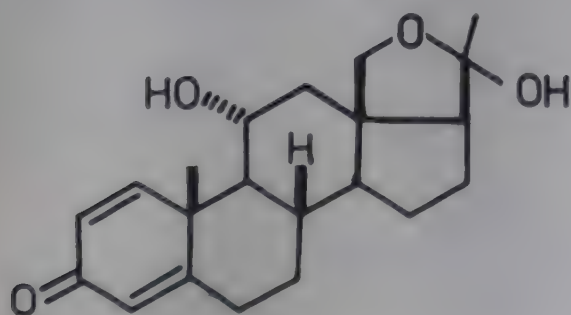


Kurchamine

R = H, R' = Me

Kurchimine

R = Me, R' = H

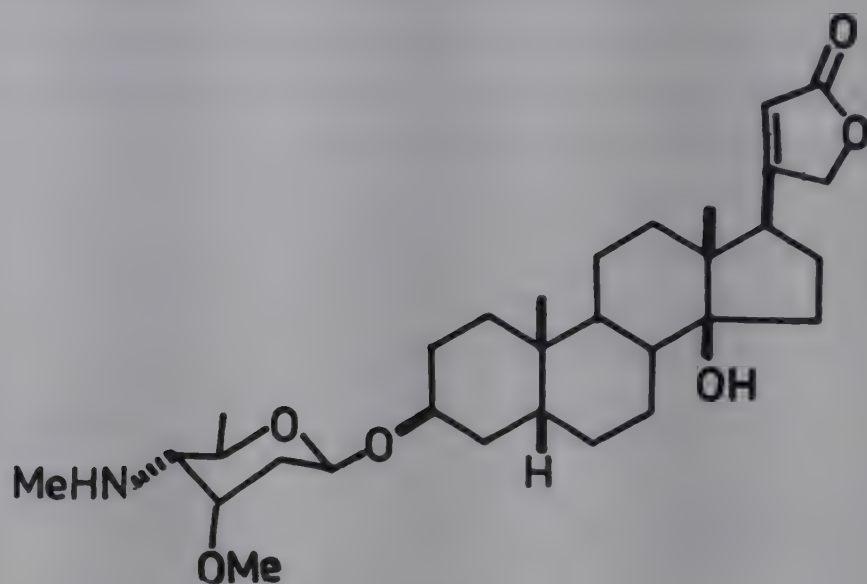


Holadysone

H. mitis R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 135).

Evidence presented for presence of N-demethylated conessines in total alkaloidal fraction from plant (*J. Chem. Soc.* 1960, 2368); a new cardenolide - mitiphylline - was characterised as 3 β -(4-deoxy-4-methylamino- β -D-cymaropyranosido)-14 β -hydroxy-5 β -card-20(22)-enolide (*C.R.Acad. Sci. Paris, Ser. C* 1968, 267, 1050; *Chem. Abstr.* 1969, 70, 115416 c).

NEW COMPOUNDS



Mitiphylline

HOPEA (Dipterocarpaceae)

H. odorata Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 136).

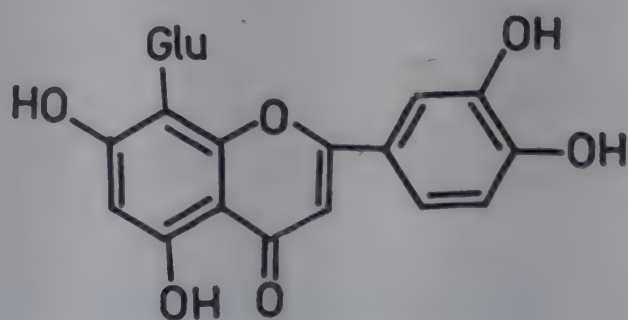
Hopeaphenol containing at least two 4-hydroxybenzyl units from heartwood (*J. Chem. Soc.* 1965, 406).

HORDEUM (Poaceae)

H. vulgare L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 136).

Isolation of a luteolin glycoside (*J. Org. Chem.* 1959, 24, 1995); flavone glycosides - orientoside and orientin - isolated; orientoside identified as vitexin; structure of orientin as luteolin analog determined (*Arch. Pharm.* 1959, 292, 380; *Chem. Abstr.* 1960, 54, 5010 f).

NEW COMPOUNDS



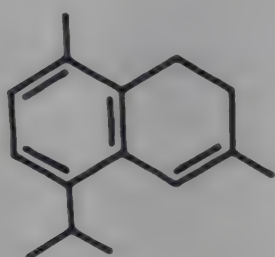
Orientin

HUMULUS (Cannabaceae)

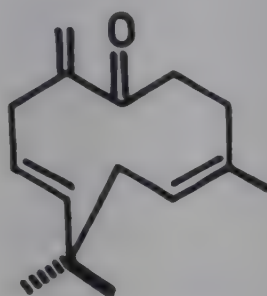
H. lupulus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 136).

Astragalin, isoquercitrin, rutin and three more flavonoids isolated which appeared to be quercitrin glycosides and a kaempferol glycoside (*J. Chromatogr.* 1964, 16, 130; *Chem. Abstr.* 1965, 62, 4323 g); leucocyanidin and leucodelphinidin detected by chromatography (*Bull. Soc. Bot. Fr.* 1964, 111, 69; *Chem. Abstr.* 1965, 63, 16765 b); humuladienone, humulenone, α -corocalene and γ -calacorene isolated from hop oil (*Bull. Chem. Soc. Jpn.* 1969, 42, 2088).

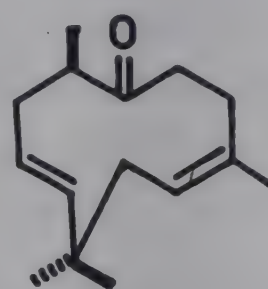
NEW COMPOUNDS



α -Corocalene



Humulenone



Humuladienone

HUNNEMANNIA (Papaveraceae)

H. fumariaefolia Sweet

Eng. - Mexican tulip poppy.

Hunnemanine, mp. 208°, allocryptopine, protopine, chelerythrine, sanguinarine, chelilutine, chelirubine, coptisine, berberine, corysamine and a new alkaloid - HF-1, mp. 201° - present in plant (*Collect. Czech. Chem. Commun.* 1966, 31, 1355).

Distribution : Grown in gardens as ornamental.

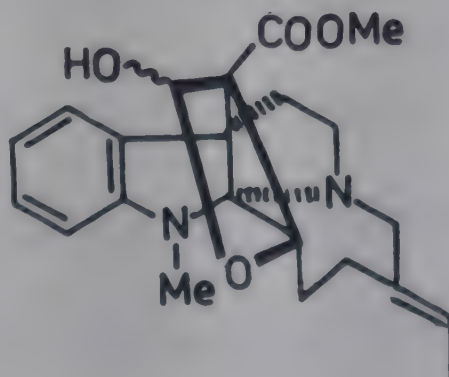
HUNTERIA (Apocynaceae)

H. corymbosa Roxb. see *H. legocii* Livera

H. legocii Livera syn. *H. corymbosa* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 136).

An alkaloid - corymine (0.076%), mp. 189° - from leaves (*Proc. Chem. Soc.* 1962, 298; *Chem. Abstr.* 1963, 58, 3471 h); crystal structure of corymine (*Chem. Ind.* 1965, 603).

NEW COMPOUNDS



Corymine

HYDRANGEA (Hydrangeaceae)*H. macrophylla* (Thunb.) Ser.

Hydrangenol glucoside isolated from flowers and roots (*Can. J. Biochem. Physiol.* 1960, 38, 627; *Chem. Abstr.* 1960, 54, 17579 i); a derivative of daphnetin, umbelliferone and a new monohydroxy- methoxycoumarin from roots (*Can. J. Biochem. Physiol.* 1961, 39, 1389; *Chem. Abstr.* 1962, 56, 1526 b); 7-(β -D-coumarin (skimmin) and cis-2,4-bis (β -D-glucosyloxy) cinnamic acid identified in leaf extract (*Phytochemistry* 1965, 4, 255).

Distribution : Native of China and Japan, introduced in hill stations in India as ornamental plant.

HYDROCOTYL (Apiaceae)*H. asiatica* L.; see *Centella asiatica* (L.) Urban**HYGROPHILA** (Acanthaceae)

H. auriculata (K. Schum.) Heine syn. *Asteracantha longifolia* (L.) Nees, *H. spinosa* T. Anders. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 138).

Decoction of whole plant as also the water extract of its ash showed diuretic action in rats, which was attributed to presence of potassium salts in high concentration (*Indian J. Med. Res.* 1967, 55, 714).

Xylose and uronic acids from oil of seeds (*Pakistan J. Sci. Ind. Res.* 1967, 10, 82); lupeol, stigmasterol and straight-chain hydrocarbons from lipid extract of plant (*J. Indian Chem. Soc.* 1967, 44, 82).

H. spinosa T. Anders.; see *H. auriculata* (K. Schum.) Heine

HYGRORYZA (Poaceae)

H. aristata (Retz.) Nees ex W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 138).

Analysis of grass for free amino acids and amino acids in peptides and protein hydrolysates; protein content of grass 7.92% (*Sci. Cult.* 1965, 31, 240).

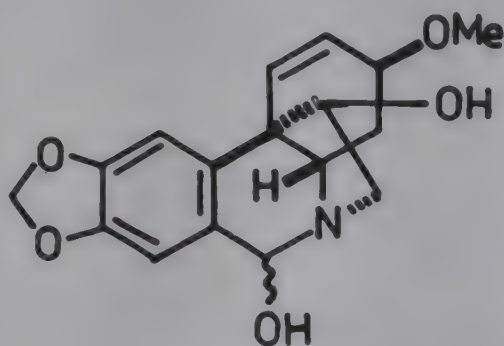
HYMENOCALLIS (Amaryllidaceae)*H. concinna* Baker syn. *H. dillenii* Roem.

Eng. - Spider lily.

Tazettine, mp. 205° and haemanthidine, mp. 188°, isolated from bulbs (*Curr. Sci.* 1969, 38, 341).

Distribution : Native of Mexico. Ornamental plant, naturalised in several parts of India.

NEW COMPOUNDS



Haemanthidine

H. dillenii Roem.; see *H. concinna* Baker

HYOSCYAMUS (Solanaceae)

H. muticus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 138).

BIOLOGICAL ACTIVITY

Atropine showed tranquillising properties in low doses and thymoleptic activity in high doses, whereas scopolamine showed thymoleptic effects especially in higher doses (*Arzneim. Forsch.* 1962, 12, 309; *Chem. Abstr.* 1962, 57, 2808 e).

H. niger L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 138).

Synthesis of scopoline via trans-6,7-dihydroxytropine (*U.S. Dept. Com., Office Tech. Serv. PB Rep.* 152096 (1959) 8 pp.; *Chem. Abstr.* 1963, 58, 555 c); rutin isolated (*Pharmazie* 1960, 15, 643; *Chem. Abstr.* 1962, 57, 16744 i).

BIOLOGICAL ACTIVITY

Scopolamine administered i.p. protected guinea pig against bronchospasm produced by inhalation of histamine spray. It had antihistaminic activity equal to that of atropine but was almost inactive even at high dose against oedema of rat paw injected with kaolin suspension (*Congr. Int. Therap.*, 6th, Strasbourg 1959, 443; *Chem. Abstr.* 1962, 56, 12258 f); scopolamine HBr at 1-50 mg/kg had antihistaminic effects in guinea pig (*Therapie* 1960, 15, 326; *Chem. Abstr.* 1962, 57, 9176 g).

HYPECOUM (Papaveraceae)

H. leptocarpum Hook.f. & Thoms.

Protopine, sanguinarine, chelirubine, coptisine and new alkaloids - allocryptopine and chelerythrine - isolated (*Collect. Czech. Chem. Commun.* 1961, 26, 1472).

Distribution : North-western and Sikkim Himalayas, alt. 3500-4200 m.

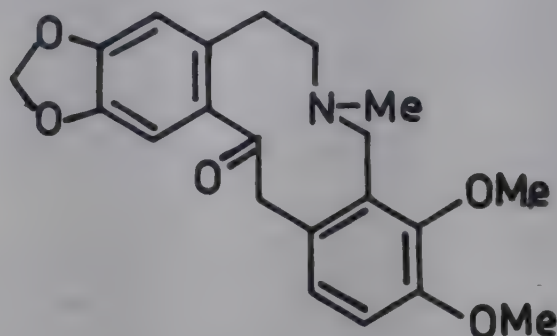
H. pendulum L. syn. *H. procumbens* auct. (non L.), *H. procumbens* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 138).

Protopine, sanguinarine, chelirubine, coptisine, chelerythrine and α -allocryptopine iso-

lated (*Collect. Czech. Chem. Commun.* 1961, 26, 1472).

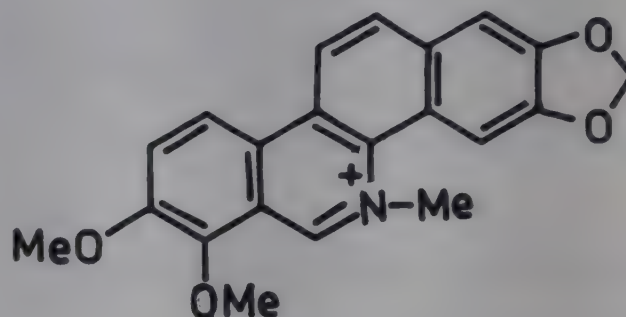
Note : In Glossary *H. pendulum* L. and *H. procumbens* L. are wrongly treated as two distinct species.

NEW COMPOUNDS



α -Allocryptopine

H. procumbens L.; see *H. pendulum* L.



Chelerythrine

HYPERICUM (Hypericaceae)

H. perforatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 138).

An antibacterial preparation, novoimanin, made from plant, was effective against *Staphylococcus aureus* in concentration of 0.1 parts/million (*Novoimanin Ego Lech. Svoistva* 1968, 15; *Chem. Abstr.* 1969, 71, 73981 w). A new catechol preparation, peflavit, having vitamin P activity, prepared from plant (*Farmatsiya* 1965, 15, 92; *Chem. Abstr.* 1965, 63, 11250 h).

Leaf extract showed presence of hyperoside and rutin by PC (*Biul. Inst. Roslin. Lecznichych* 1959, 5, 227; *Chem. Abstr.* 1960, 54, 16749 d); total flavonoid and hyperoside content in herb determined as 5 and 4% (with rutin) respectively (*Planta Med.* 1960, 8, 95; *Diss. Pharm.* 1961, 13, 73; *Chem. Abstr.* 1961, 55, 15841 d); rutin obtained from leaves (2.0) and flowers (0.095%); poly-leucocyanidin also isolated (*Diss. Pharm.* 1961, 13, 73); rutin, hyperin and quercetin isolated from aerial parts (*Med. Prom. SSSR* 1964, 18, 41; *Chem. Abstr.* 1964, 61, 8130 b).

BIOLOGICAL ACTIVITY

Hyperoside showed diuretic activity in dogs while rutin reduced diuresis (*Biul. Inst. Roslin Lecznichych* 1959, 5, 227; *Chem. Abstr.* 1960, 54, 16749 d; *Planta Med.* 1960, 8, 95).

IBERIS (Brassicaceae)

I. amara L.

Eng. - Candytuft.

Presence of cucurbitacins E and I in plant; latter identical with ibamarin, mp. 143° (*Acta Chem. Scand.* 1962, 16, 649; *ibid.* 1962, 16, 1802).

Distribution : Grown in gardens as ornamental.

ILEX (Aquifoliaceae)

I. praguariensis St. Hilaire (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New

Delhi, 1956, p. 139).

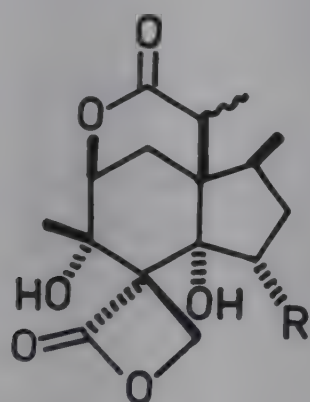
Neochlorogenic acid and 5-O-caffeoylquinic acid from leaves; lactonisation of neochlorogenic acid gave caffeoylquinic acid, an artifact previously reported as natural product (*Anales Assoc. Quim. Arg.* 1964, 52, 237; *Chem. Abstr.* 1965, 63, 11418 g).

ILLICIUM (Illiciaceae)

I. anisatum L. syn. *I. religiosum* Sieb. & Zucc. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 140).

Anisatin, mp. 227°, along with new toxic compound - neoanisatin, mp. 237° - isolated from seeds and its structure determined (*Tetrahedron Lett.* 1965, 4785; *ibid.* 1966, 4739).

NEW COMPOUNDS



Anisatin

R = OH

Neoanisatin

R = H

I. religiosum Sieb. & Zucc.; see *I. anisatum* L.

IMPATIENS (Balsaminaceae)

I. balsamina L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 140).

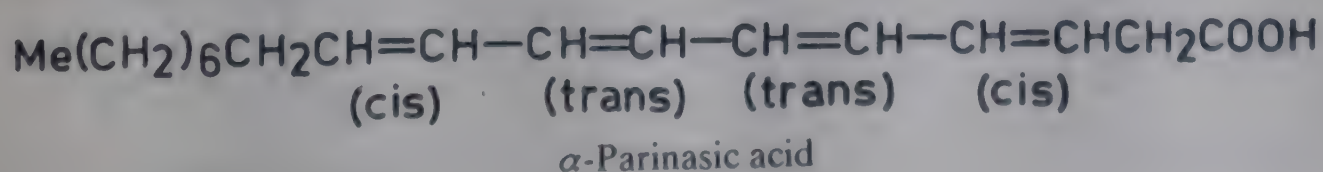
2-Hydroxy-1,4-naphthoquinone isolated from plant (*Can. J. Biochem.* 1965, 43, 293).

I. edgeworthii Hook.f.

α -Parinasic acid, major constituent of fatty acid from seed oil, characterised as cis,trans-trans,cis-9,11,13,15-octadecatetraenoic acid (*Lipids* 1966, 1, 263; *Chem. Abstr.* 1966, 65, 10488 e).

Distribution : Temperate north-western Himalayas from Kashmir to Himachal Pradesh.

NEW COMPOUNDS

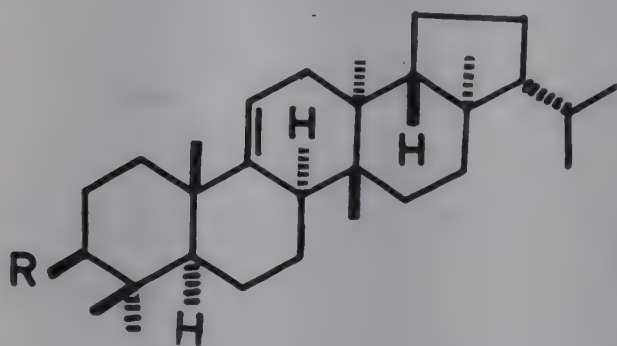


IMPERATA (Poaceae)

I. arundinacea Cyrill.; see *I. cylindrica* (L.) P. Beauv.

I. cylindrica (L.) P. Beauv. syn. *I. arundinacea* Cyrill (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 140).

Isolation of five triterpenoids - cylindrin, mp. 269°, arundoin, mp. 242°, fernenol, isoarborinol and simiarenol - from rhizomes; structures of first three determined (*Chem. Pharm. Bull.* 1965, 13, 224; *Tetrahedron Lett.* 1965, 2245; *Tetrahedron* 1968, 24, 735).

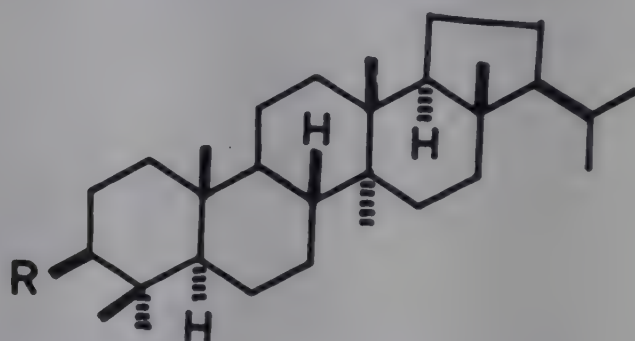
NEW COMPOUNDS

Arundoin

R = OMe

Fernenol

R = OH



Cylindrin

R = OMe

Isoarborinol

R = OH

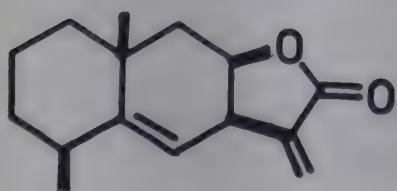
INULA (Asteraceae)

I. grantioides Boiss. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 141).

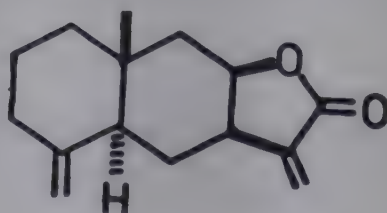
An alkaloid, mp. 207°, isolated (*Pakistan J. Sci. Ind. Res.* 1961, 4, 273; *Chem. Abstr.* 1962, 57, 11308 g).

I. helenium L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 141).

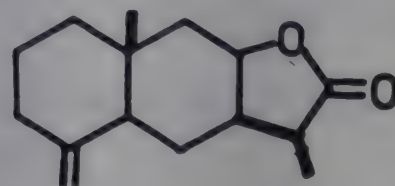
Sesquiterpene lactones - alantolactone, mp. 78°, isoalantolactone, mp. 111°, dihydroisoalantolactone, mp. 171°, eudesma-5,7(11)-dien-8β,12-olide, mp. 88° and eudesma-4(15),7(11)-dien-8β,12-olide, mp. 129°, from roots (*J. Prakt. Chem.* 1959, 9, 107; *Chem. Abstr.* 1960, 54, 6793 b; *Israel J. Chem.* 1967, 5, 23; *Chem. Abstr.* 1967, 67, 32812 r).

NEW COMPOUNDS

Alantolactone



Isoalantolactone

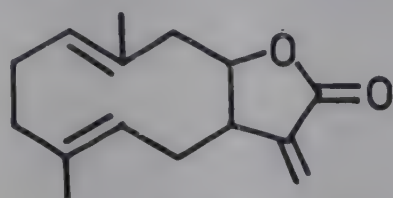


Dihydroisoalantolactone

I. racemosa Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 141).

Alantolactone, isoalantolactone and dihydroisolantolactone from roots (*Tetrahedron* 1967, 23, 2469); a germacranolide - inunolide - from root oil (*Indian J. Chem.* 1969, 7, 310).

NEW COMPOUNDS

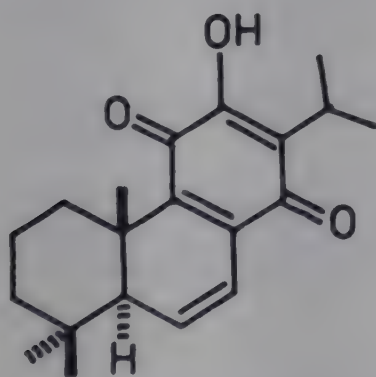


Inunolide

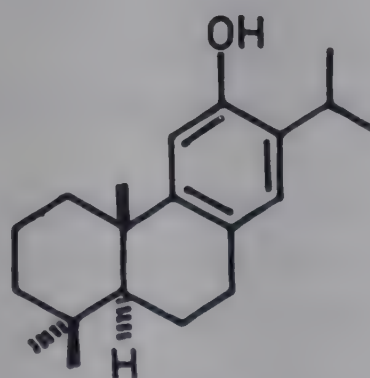
I. royleana DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 141).

Diterpene alkaloids - roylene and inuline, mp. 160°-isolated from roots and found identical with lycoctonine and anthranoyllycoctonine respectively (*J. Indian Chem. Soc.* 1959, 36, 437); an amorph. alkaloid fraction containing roylene and inuline showed curariform activity (*J. Sci. Ind. Res.* 1959, 18B, 534); four diterpenoid quinones - royleanone, its 9-acetoxy derivative, its 9-dehydro derivative and ferruginol - isolated from roots; their structures determined (*Can. J. Chem.* 1962, 40, 1540).

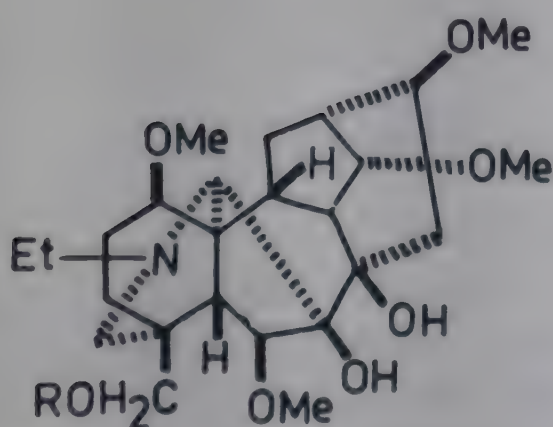
NEW COMPOUNDS



9-Dehydroroyleanone

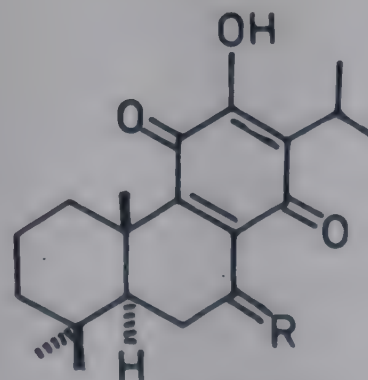


Ferruginol



Inuline

R = Anthranoyl



Royleanone

R = H,H

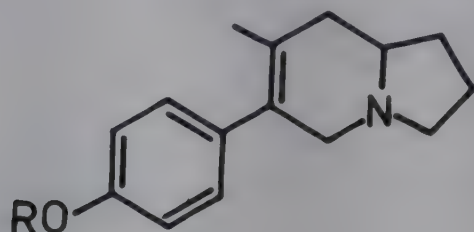
9-Acetoxyroyleanone

R = H,OAc

IPOMOEA (Convolvulaceae)

I. alba L. syn. *Calonyction aculeatum* House, *I. bona-nox* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 45, 141).

Isolation and structures of new hexahydroindolizine alkaloids - ipalbine, mp. 118° and ipalbidine, mp. 147° - from seeds (*Chem. Commun.* 1969, 709).

NEW COMPOUNDS

Ipalbine

R = Glu

Ipalbidine

R = H

I. bona-nox L.; see *I. alba* L.

I. carnea Jacq.; see *I. carnea* Jacq. ssp. *fistulosa* (Mart. ex Choisy) D. Austin

I. carnea Jacq. ssp. *fistulosa* (Mart. ex Choisy) D. Austin syn. *I. carnea* sensu Parker (non Jacq.)
H. - Behaya, Beshram booti.

A resin, β -sitosterol, triacontane and saponin from leaves (*Labdev* 1964, 2, 220; *Chem. Abstr.* 1965, 62, 9460 b).

Distribution : Native of South America. Introduced as ornamental plant. Now naturalised and runs wild almost throughout Indian plains along watercourses.

Note : Indian plant belongs to ssp. *fistulosa*.

I. digitata L.; see *I. paniculata* (L.) R.Br.

I. hederacea (L.) Jacq.; see *I. nil* (L.) Roth

I. muricata (L.) Jacq.; see *I. turbinata* Lag.

I. nil (L.) Roth syn. *I. hederacea* auct. (non L.) Jacq. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 142).

Seeds used as purgative in Pakistan (*Nature* 1966, 212, 618).

Seed oil contained palmitic (6.8), stearic (17.5), arachidic (7.0), oleic (48.4), linoleic (15.3) and linolenic (5.0%) acids; PC of acid hydrolysate of seed extract showed presence of galactose, xylose and arabinose (*J. Proc. Inst. Chemists*, Calcutta 1959, 31, 285; *Chem. Abstr.* 1960, 54, 16559 e); presence of lysergol and chanoclavine in seeds (*Nature* 1966, 212, 618).

I. paniculata (L.) R.Br. syn. *I. digitata* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 142).

Alcoholic extract of tubers showed stimulant as well as depressant actions on different organ systems along with convulsant effect on central nervous system (*Indian J. Med. Sci.* 1969, 23, 479).

β -Sitosterol and another sterol, mp. 72° , from tubers (*Indian J. Appl. Chem.* 1964, 27, 155; *Chem. Abstr.* 1965, 62, 5576 a); fixed oil from tubers contained palmitic, stearic, oleic, linoleic and linolenic acids (*J. Pharm. Sci.* 1965, 54, 471).

I. purpurea (L.) Roth

TLC and PC showed the presence of ergoline alkaloids - ergine, isoergine and penniclavine - in seeds (*Sci.* 1965, 148, 499).

Distribution : Native of tropical America, introduced into India as ornamental. Now naturalised and found throughout India upto 2000 m. in Himalayas.

I. tuberosa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 143).

Presence of ergoline alkaloids - ergine, isoergine and penniclavine - in seeds by TLC and PC (*Sci.* 1965, 148, 499).

I. turbinata Lag. syn. *Calonyction muricatum* (L.) G. Don, *I. muricata* (L.) Jacq. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 45, 142).

Seeds commonly used as purgative in Pakistan, contained lysergol and chanoclavine (*Nature* 1966, 212, 618); a glycoside - muricatin, composed of 11-hydroxy-hexadecanoic acid and 4-O-L-rhamnopyranosyl-L-rhamnopyranose - from seeds (*J. Pharm. Sci.* 1967, 56, 771).

BIOLOGICAL ACTIVITY

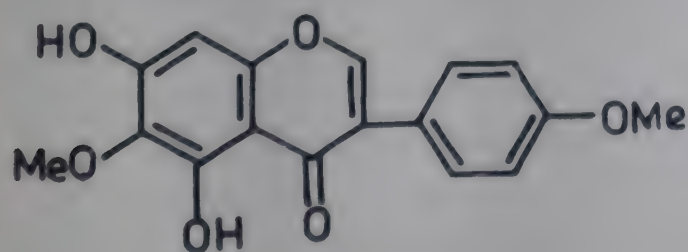
Muricatin is a cardiac depressant, spasmolytic to smooth musculature of gut and lowers pressure of anaesthetised dog (*J. Pharm. Sci.* 1967, 56, 771).

IRIS (Iridaceae)

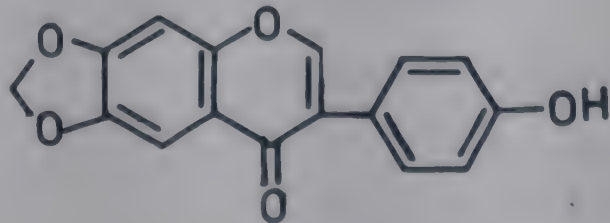
I. decora Wall. syn. *I. nepalensis* D. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 143).

New isoflavone - irisolone, mp. 269° - isolated from rhizomes and characterised (*Tetrahedron* 1961, 16, 201); known isoflavone - irigenin, mp. 185° - from rhizomes (*Indian J. Chem.* 1963, 1, 187); another new isoflavone - irisolidone - isolated and characterised as 5,7-dihydroxy-4',6-dimethoxyisoflavone (*J. Org. Chem.* 1965, 30, 3561).

NEW COMPOUNDS



Irisolidone



Irisolone

I. germanica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 143).

Variations in content and composition of fatty acids in different seasons determined in rhizomes and roots (*Arch. Farm.* 1967, 17, 7; *Chem. Abstr.* 1968, 68, 66339 c); embinin isolated from petals and characterised as 6-C(X,X-di-O-L-rhamnosyl- β -D-glucopyranosyl)-4',7-di-O-methylapigenin (*Agric. Biol. Chem.* 1968, 32, 537).

I. nepalensis D. Don; see *I. decora* Wall.

ISOTOMA (Campanulaceae)

I. longiflora Presl.; see *Laurentia longiflora* (L.) Endl.

IXORA (Rubiaceae)

I. arborea Roxb. ex Sm. syn. *I. parviflora* Vahl (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 143).

Ixoral, mp 246°, and β -sitosterol from leaves (*Pakistan J. Sci. Ind. Res.* 1968, 11, 12; *Chem. Abstr.* 1968, 69, 49795 b).

I. coccinea L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 143).

Mixture of monoglycosides of cyanidin and delphinidin isolated (*J. Sci. Ind. Res.* 1962, 21B, 591).

I. johnsoni Hook.f.

Mixture of monoglycosides of cyanidin and delphinidin isolated (*J. Sci. Ind. Res.* 1962, 21B, 591).

Distribution : Western peninsula, reported from Cochin.

I. parviflora Vahl; see *I. arborea* Roxb. ex Sm.

JACARANDA (Bignoniaceae)

J. acutifolia Humb. & Bonpl.

H. - Jacranda.

3-Monoglucoside and 3,5-diglucoside of delphinidin present in flowers (*C.R. Acad. Sci. Paris, Ser. D.* 1964, 258, 2386; *Chem. Abstr.* 1964, 60, 13569 g).

Distribution : Native of tropical America, introduced in Indian gardens as ornamental tree, also planted in avenues.

JACQUINIA (Myrsinaceae)

J. armillaris Jacq.

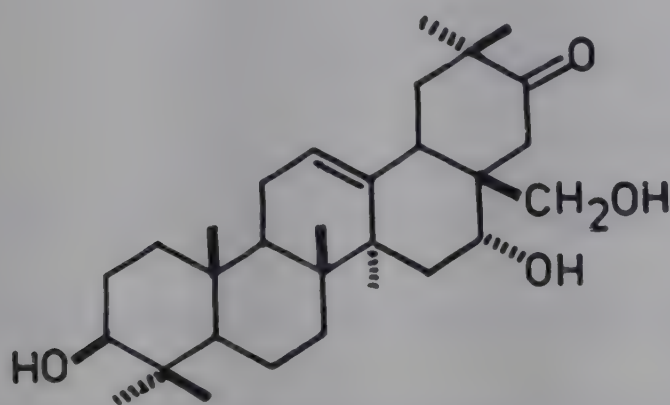
Eng. - Bracelet wood.

Genin C, mp. 225°, isolated and identified as 3 β ,16 α ,28-trihydroxyoleanene (*C. R. Acad.*

Sci. Paris, Ser. D. 1961, 252, 805; *Chem. Abstr.* 1961, 55, 16590 b); a new triterpene - armillarigenin - isolated and characterised as $3\beta,16\alpha,28$ -trihydroxy-21-oxo-olean-12-ene (*Bull. Soc. Chim. Fr.* 1969, 226; *Chem. Abstr.* 1969, 70, 106708 x).

Distribution : Native of tropical America and West Indies, introduced in India and grown in gardens.

NEW COMPOUNDS



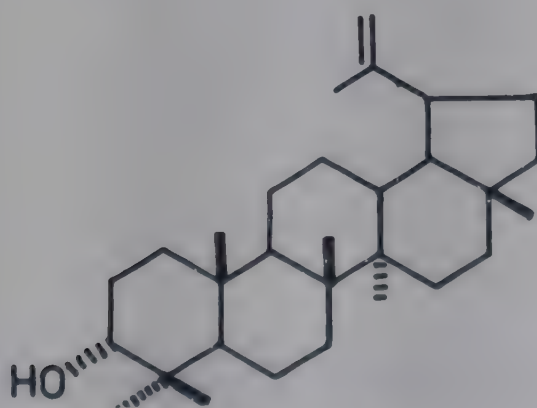
Armillarigenin

JASMINUM (Oleaceae)

J. auriculatum Vahl (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 144).

Lupeol, D-mannitol, n-triacontanol, hentriacontane and epilupeol, mp. 208° , from leaves (*Curr. Sci.* 1967, 36, 233; *Experientia* 1968, 24, 421; *Indian J. Appl. Chem.* 1968, 31, 240; *Chem. Abstr.* 1969, 71, 78129 j).

NEW COMPOUNDS

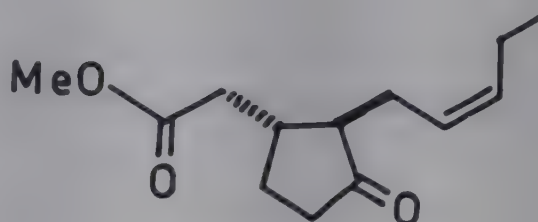


Epilupeol

J. grandiflorum L. syn. *J. officinale* L. var. *grandiflorum* Bailey (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 144).

Isolation of characteristic odoriferous constituent of jasmine essence - methyljasmonate, bp. $93^{\circ}/0.02$ mm. (*Helv. Chim. Acta* 1962, 45, 675); synthesis of racemic (5-pent-2-enyl)-5,1-pentanolide, a fragrant component of jasmine oil (*Helv. Chim. Acta* 1962, 45, 1256).

NEW COMPOUNDS



Methyljasmonate

J. officinale L. var. *grandiflorum* Bailey; see *J. grandiflorum* L.

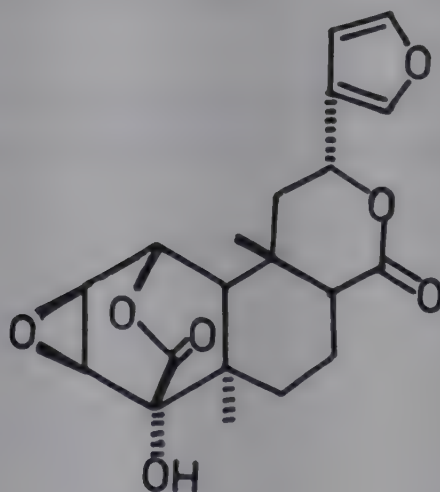
JATEORHIZA (Menispermaceae)

J. palmata (Lamk.) Miers (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 145).

Root extract inhibited growth in vitro of eight fungi (*Pharm. Ztg.* 1968, 113, 945; *Chem. Abstr.* 1968, 69, 61517 v).

Bitter constituents - columbin, chasmanthin, palmarin and jateorin - present; constitution of palmarin determined (*J. Chem. Soc.* 1962, 4809; *J. Chem. Soc. C* 1966, 1482).

NEW COMPOUNDS



Palmarin

JATROPHA (Euphorbiaceae)

J. curcas L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 145).

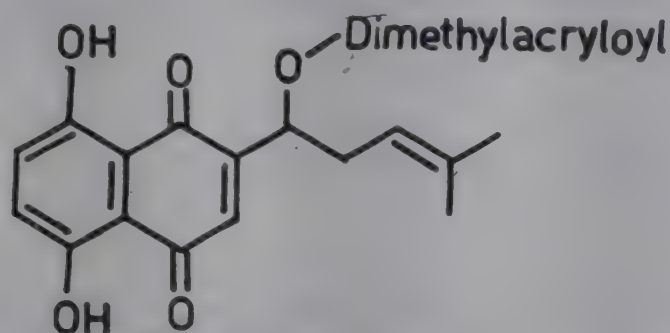
Ash of seeds (4.38%) contained Ca, Mg, Na, K and traces of P; presence of oleic, linoleic, myristic, palmitic, stearic, arachidic acids and sitosterol; detection of glucose, arabinose, xylose and rhamnose in seeds by PC (*J. Proc. Inst. Chemists*, Calcutta 1959, 31, 213; *Chem. Abstr.* 1960, 54, 9001 e).

J. glandulifera Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 145).

Major pigment of plant was characterised as 3,3-dimethylacryloylshikonin (*Phytochemistry*

1969, 8, 1587).

NEW COMPOUNDS



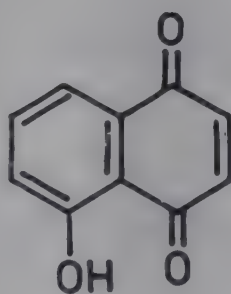
3,3-Dimethylacryloylshikonin

JUGLANS (Juglandaceae)

J. regia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 145).

Juglone isolated and characterised as 5-hydroxy-1,4-naphthoquinone (*Chem. Pharm. Bull.* 1967, 15, 242).

NEW COMPOUNDS



Juglone

BIOLOGICAL ACTIVITY

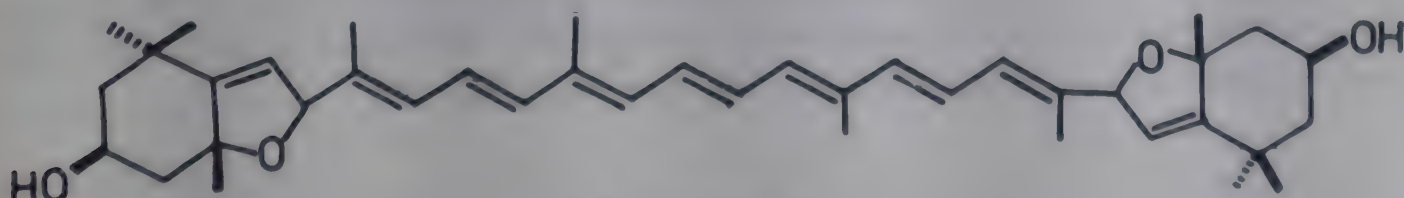
Juglone inhibited growth of *Trichophyton mentagrophytes* (*Chem. Pharm. Bull.* 1967, 15, 242).

JUNCUS (Juncaceae)

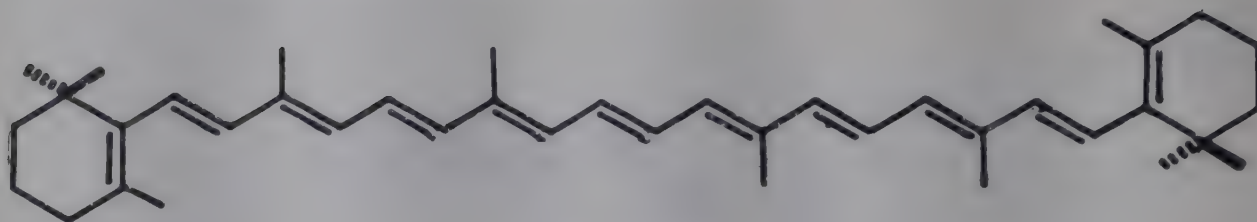
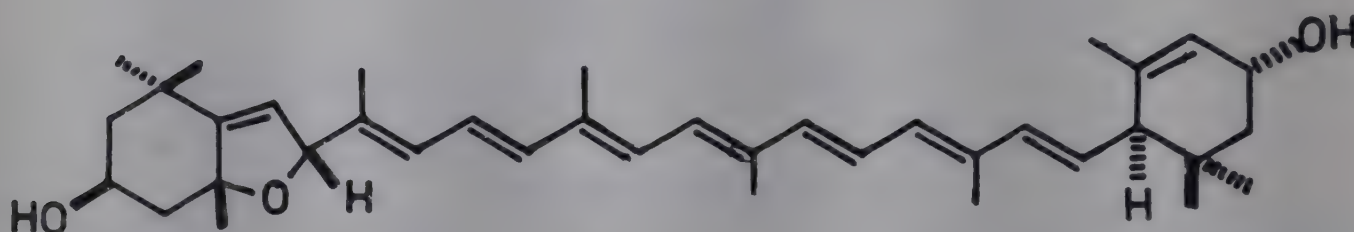
J. bufonius L.

Lutein, β -carotene, cryptoxanthin, auroxanthin, neoxanthin (foliaxanthin), flavoxanthin, chrysanthemaxanthin (stereoisomer of flavoxanthin), violaxanthin and flavochrome isolated (*Acta Chem. Scand.* 1968, 22, 2056).

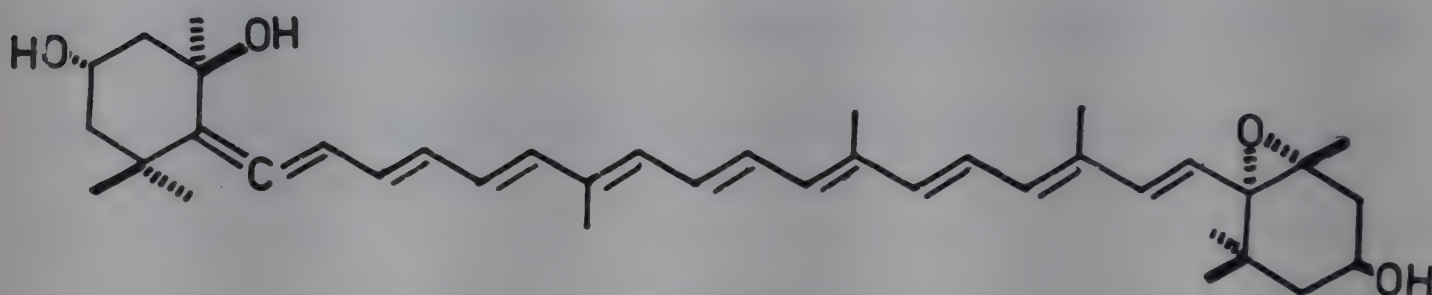
NEW COMPOUNDS



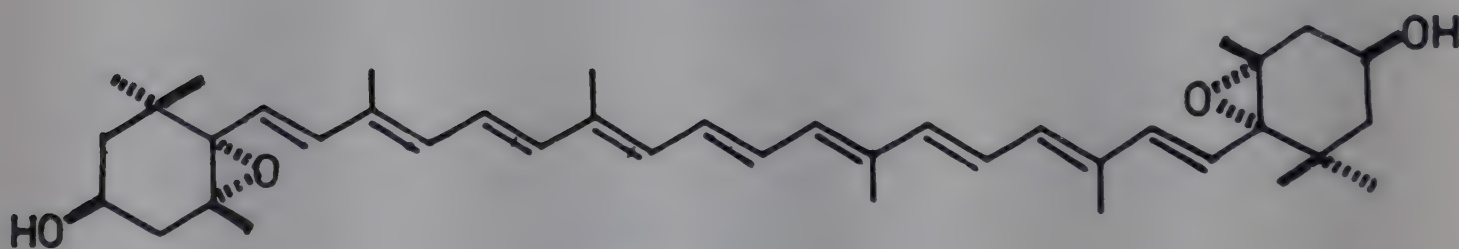
Auroxanthin

 β -Carotene

Flavoxanthin



Neoxanthin



Violaxanthin

J. effusus L.

Luteolin-7-glucoside, diosmin and hesperidin from leaves (*C. R. Acad. Sci. Paris, Ser. D* 1966, 263, 439; *Chem. Abstr.* 1966, 65, 18989 c).

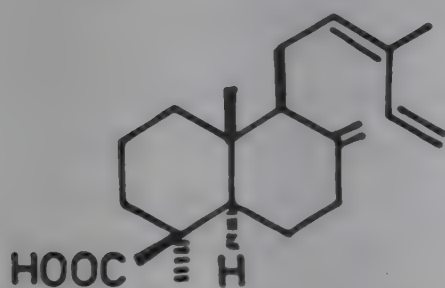
Distribution : Northern India, from plains to 4000 m. in Himalayas.

JUNIPERUS (Cupressaceae)

J. communis L. var. *saxatilis* Pallas syn. *J. communis* (auct. L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi. 1956, p. 146).

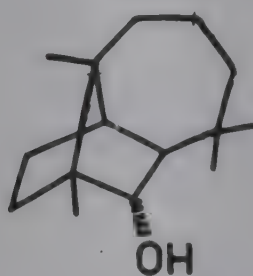
Isolation of communic acid, mp. 228° (0.12%) from bark (*Acta Chem. Scand.* 1961, 15, 225; *J. Sci. Ind. Res.* 1962, 21B, 201); structure of communic acid elucidated (*Tetrahedron* 1961, 16, 255); longifolene, juniperol (longiborneol), β -sitosterol, stigmasterol and a diterpene phenol - totarol - isolated from bark (*J. Sci. Ind. Res.* 1962, 21B, 236).

NEW COMPOUNDS

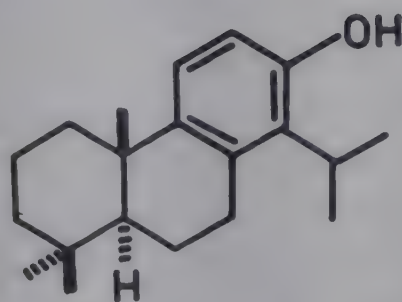


Communic acid

J. communis L.; see *J. communis* L. var. *saxatilis* Pallas



Juniperol



Totarol

KAEMPFERIA (Zingiberaceae)

K. galanga L. (*Glossary Indian Med. Plant*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 146).

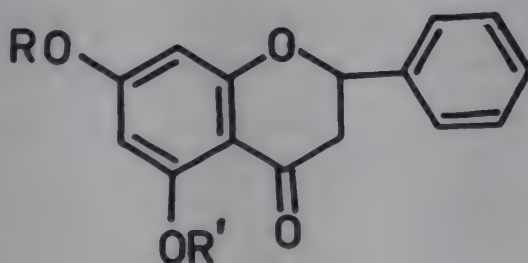
p-Methoxycinnamic acid and its methyl and ethyl esters from essential oil (*J. Proc. Inst. Chemists*, 1962, 34, 197; *Chem. Abstr.* 1963, 58, 5986 d).

K. pandurata Roxb.

Alpinetin, mp 220° and pinostrobin, mp. 100°, from rhizome (*J. Chem. Soc.* 1964, 4654).

Distribution : Western Ghats, Gujarat and South Andaman Island.

NEW COMPOUNDS



Alpinetin

R = H, R' = Me

Pirostrobin

R = Me, R' = H

K. rotunda L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 147).

A compound, mp. 149°, from tubers which, yielded benzoic acid on hydrolysis (*Curr. Sci.* 1962, 31, 480).

KALANCHOE (Crassulaceae)

K. pinnata Pers.; see *Bryophyllum pinnatum* (Lam.) Oken

KHAYA (Meliaceae)

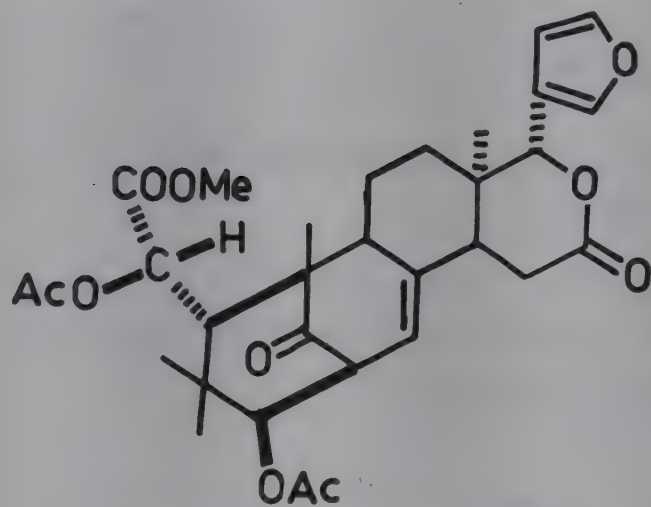
K. senegalensis A. Juss.

2,6-Dimethoxybenzoquinone, mp 252°, from bark (*Bull. Soc. Chim. Fr.* 1959, 1157); alkaline

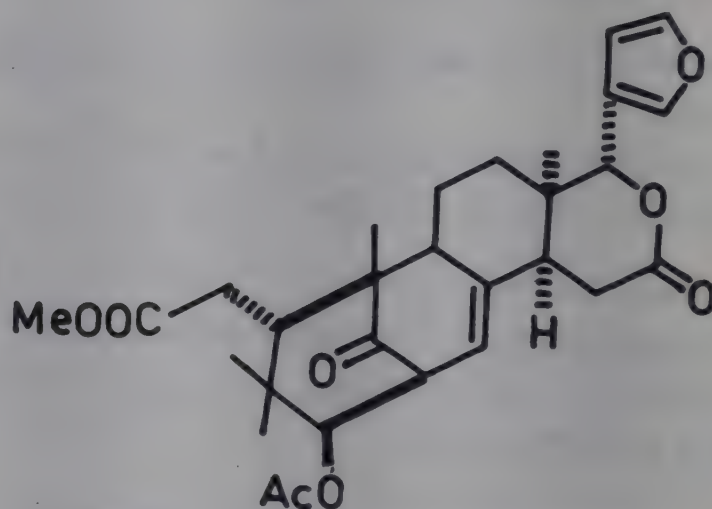
hydrolysis of gum gave three polysaccharides (*J. Chem. Soc.* 1960, 4918); khivorin, 7-deacetoxy-7-oxokhivorin, 3-deacetylkhivorin and 3-deacetyl-7-deacetoxy-7-oxokhivorin isolated from seeds (*J. Chem. Soc. C.* 1967, 554; *Chem. Commun.* 1967, 790); Me angolensate isolated from timber; mixture of Me angolensate and Me 6-hydroxyangolensate from bark; 7-deacetyl-7-oxokhivorin, 6-deoxydestigloylswietenine acetate, mp. 260° and 6-epidestigloylswietenine diacetate from seeds (*Chem. Commun.* 1967, 790); 7-deacetoxy-7-oxokhivorin, khivorin, khayasin, Me angolensate, mexicanolide and 7-deacetoxy-7-oxogedunin isolated from timber, bark, root bark, roots, leaves and seeds (*J. Chem. Soc. C.* 1968, 1974).

Distribution : Introduced in India and grown in Indian Botanic Garden, Calcutta.

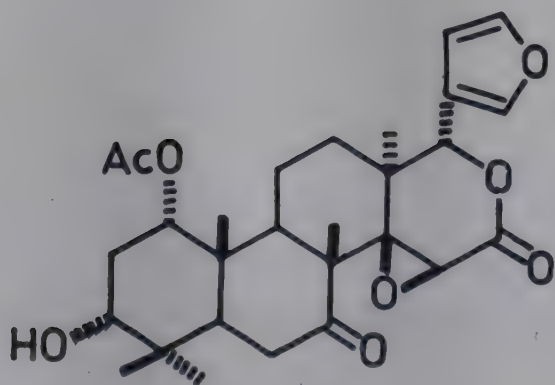
NEW COMPOUNDS



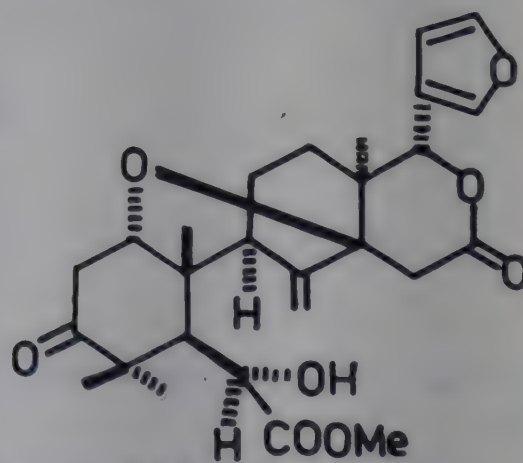
6-Epidestigloylswieteninediacetate



6-Deoxydestigloylswietenine acetate



3-Deacetyl-7-deacetoxy-7-oxokhivorin



Methyl 6-hydroxyangolensate

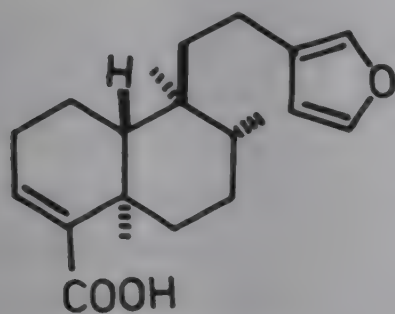
KINGIODENDRON (Papilionaceae)

K. pinnatum (Roxb. ex DC.) Harms. syn. *Hardwickia pinnata* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 130).

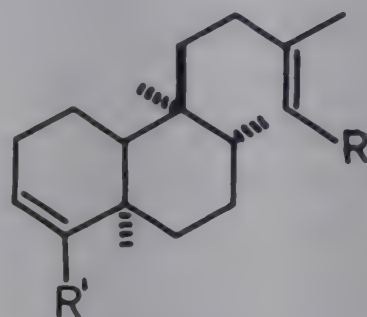
Sesquiterpene portion from oleoresin gave copaene (4.5), caryophyllene (75.0), humulene (13.0), caryophyllene oxide (2.5), humulene oxide-I (0.5), humulene oxide-II (0.5), β -caryophyllene alcohol (1.0) and unidentified compounds (3.0%); whereas from diterpenoid portion five new compounds were obtained - hardwickiic acid, mp. 106° , kolavic acid, mp.

228°, kolavenic acid methyl ester, bp. 179°/0.4 mm., kolavenol, bp. 140°/0.25 mm. and an alcohol, mp. 138° (*Tetrahedron Lett.* 1964, 3751).

NEW COMPOUNDS



Hardwickiic acid



Kolavic acid

R, R' = COOH

Kolavenol

R = CH₂OH, R' = Me

Kolavenic acid methyl ester

R = COOMe, R' = Me

KNOXIA (Rubiaceae)

K. corymbosa Willd.; see *K. sumatrensis* (Retz.) DC.

K. sumatrensis (Retz.) DC. syn. *K. corymbosa* auct. (non Willd.)

Isolation of β -sitosterol and ursolic acid (*J. Indian Chem. Soc.* 1969, 46, 301).

Distribution : Throughout tropical India and from Garhwal in the western Himalayas to Sikkim ascending to 1500 m. and in Khasi Hills upto 1200 m.

KOCHIA (Chenopodiaceae)

K. scoparia (L.) Schrad. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 147).

Presence of three alkaloids in green part of plant by PC (*Acta Polon. Pharm.* 1965, 22, 181; *Chem. Abstr.* 1965, 63, 18643 g).

K. trichophylla Voss.

H. - Kochia

Hentriacontane, hentriacontanol and an amorph. glucoside isolated (*Indian J. Chem.* 1966, 4, 545).

Distribution : Grown in gardens.

KOPSIA (Apocynaceae)

K. arborea Blume

Isolation and structure of kopsine (*Symp. Phytochem. Proc. Meeting*, Univ. Hong Kong, 1961, 27; *Chem. Abstr.* 1964, 61, 16109 h).

Distribution : Native of Java, grown in gardens in India.

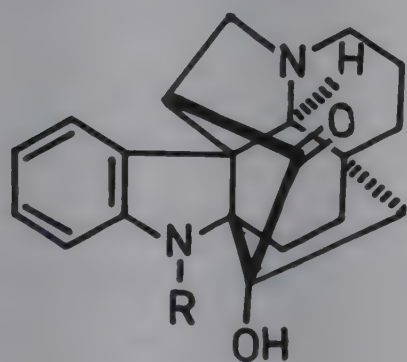
K. fruticosa A. DC.

Eng. - Pink kopsia; Tel. - Guttiganneru.

Isolation and structure elucidation of kopsine, mp. 218° (*J. Sci. Ind. Res.* 1961, 20B, 557; *Symp. Phytochem. Proc. Meeting Univ. Hong Kong* 1961, 27; *Chem. Abstr.* 1964, 61, 16109 h; *Helv. Chim. Acta* 1962, 45, 1146; *Naturwiss.* 1962, 49, 279; *Chem. Abstr.* 1962, 57, 16777 f; *Helv. Chim. Acta* 1963, 46, 572; *ibid.* 1963, 46, 679; *J. Chem. Soc.* 1963, 22; *J. Sci. Ind. Res.* 1965, 24, 108; *Helv. Chim. Acta* 1969, 52, 76); fruticosamine, mp. 161° , decarbomethoxykopsine, mp. 101° , fruticosine, mp. 221° and decarbomethoxyisokopsine, mp. 235° , isolated from leaves (*Helv. Chim. Acta* 1963, 46, 679; *J. Chem. Soc.* 1963, 22); structures of isomeric alkaloids - fruticosine and fruticosamine (*J. Chem. Soc. C* 1967, 813); β -amyrin, its acetate and γ -sitosterol isolated from stem bark (*J. Indian Chem. Soc.* 1968, 45, 962).

Distribution : Native of Burma, grown in gardens in India.

NEW COMPOUNDS

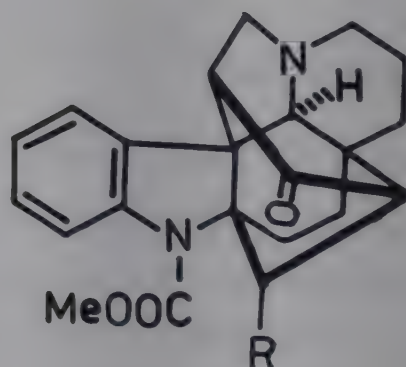


Kopsine

R = COOMe

Decarbomethoxykopsine

R = H

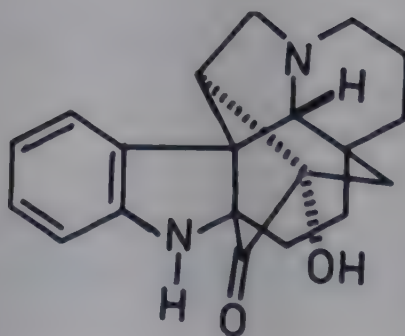


Fruticosine

R = β -OH

Fruticosamine

R = α -OH



Decarbomethoxyisokopsine

LABLAB (Papilionaceae)

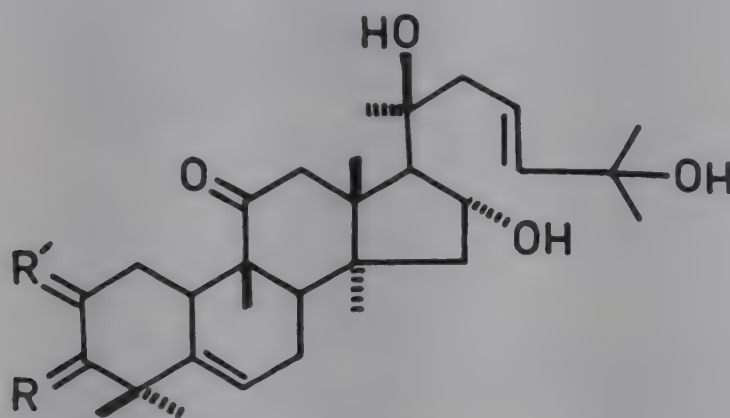
L. purpureus (L.) Sweet syn. *Dolichos lablab* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 101).

L-Pipecolic acid from legumes (*Meiji Daigaku Nogakubu Kenkyn Hokoku* 1966, 75; *Chem. Abstr.* 1967, 66, 83078 t).

LAGENARIA (Cucurbitaceae)

L. siceraria (Molina) Standl. syn. *L. vulgaris* Ser. (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 148).

Two triterpenoids - 22-deoxocucurbitacin D and 22-deoxoisocucurbitacin D - from fruits (J. Chem. Soc. C 1967, 964).

NEW COMPOUNDS

22-Deoxocucurbitacin D

R = O, R' = H, β -OH

22-Deoxoisocucurbitacin D

R = H, β -OH, R' = O

L. vulgaris Ser.; see *L. siceraria* (Molina) Standl.

LAGERSTROEMIA (Lythraceae)

L. flos-reginae Retz.; see *L. reginae* Roxb.

L. reginae Roxb. syn. *L. speciosa* (L.) Pers., *L. flos-reginae* Retz. p.p. (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 148).

The drug 'Banaba' made from leaves showed hypoglycaemic properties (Nature 1961, 190, 1108).

Detection of alanine, isoleucine, α -aminobutyric acid and methionine by PC (Nature 1961, 190, 1108).

L. speciosa (L.) Pers.; see *L. reginae* Roxb.

LAMIUM (Lamiaceae)

L. album L. (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 149).

Quercimeritrin, mp. 251°, kaempferol-3-diglycoside and kaempferol-4'-glycoside, mp. 184°, from fruits (Diss. Pharm. 1964, 16, 91; Chem. Abstr. 1964, 61, 16438 c).

L. amplexicaule L.

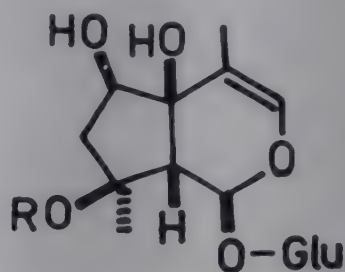
Eng. - Henbit.

Two new iridoids - lamioside and lamiol - isolated and their structures elucidated (Ric. Sci.

1967, 37, 115; *Chem. Abstr.* 1967, 67, 108515 u).

Distribution : Temperate Himalayas from Kashmir to Kumaon and Sikkim upto 3000 m.

NEW COMPOUDNS



Lamiol

R = H

Lamioside

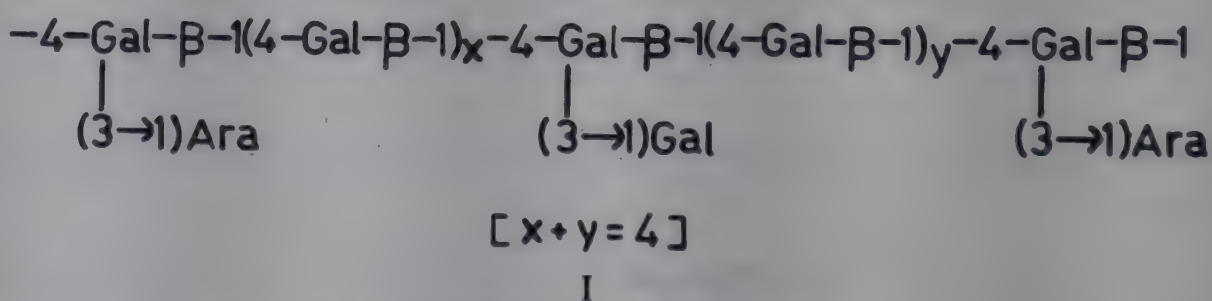
R = Ac

LANNEA (Anacardiaceae)

L. coromandelica (Houtt.) Merr. syn. *L. grandis* (Dennst.) Engl., *Odina woodier* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 149).

Quercetin, isoquercitrin, morin and ellagic acid isolated from flowers; phlobatannins and unidentified hydroxyanthraquinones found in stem bark; leucocyanidin and leucodelphinidin detected in leaves (*Curr. Sci.* 1963, 32, 115); dl-epicatechin and leucocyanidin isolated from bark (*Leather Sci.* 1967, 14, 230; *Chem. Abstr.* 1967, 67, 105960 z); quercetin and rutin isolated from leaves (*Leather Sci.* 1968, 15, 170; *Chem. Abstr.* 1967, 70, 44833 y); plant gum is a neutral polysaccharide (I) composed of galactose and arabinose in 4:1 ratio (*Phytochemistry* 1968, 7, 2057).

NEW COMPOUNDS



L. grandis (Dennst.) Engl.; see *L. coromandelica* (Houtt.) Merr.

LANSIUM (Meliaceae)

L. domesticum Jack; see *Aglaia domestica* (Correa emend. Jack) Pellegrin

LANTANA (Verbenaceae)

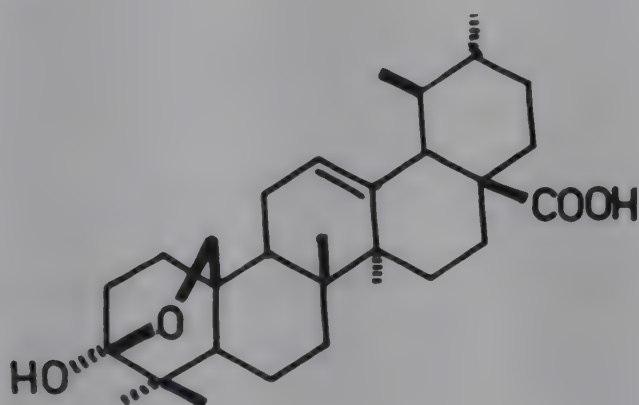
L. camara L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 149).

Alkaloid fraction lowered blood pressure, accelerated deep respiration and caused

shivering in dogs; stimulated intestinal movements and inhibited uterine motility in rats. Due to its low toxicity, alkaloid may have application in treatment of asthma, bronchiectasis, arterial hypertension and fever (*Egypt. Pharm. Bull.* 1959, 41, 43; *Chem. Abstr.* 1960, 54, 21644 h).

A new oxosteroid - lancamarone - isolated (Brit. 820,521 (1959) Sept. 23; *Chem. Abstr.* 1960, 54, 8905 g); a new triterpene - lantanolic acid, mp. 306° - isolated (*Sci. Cult.* 1966, 32, 456); Me 3-oxoursolate, mp. 191° and lantic acid, mp. 256°, isolated; structure of lantic acid elucidated (*J. Indian Chem. Soc.* 1969, 46, 100; *ibid.* 1972, 49, 1063).

NEW COMPOUNDS



Lantic acid

L. indica Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 150).

Essential oil from leaves contained dl- α -pinene (25.4), 3-carene (8.8), p-cymole (6.3), humulene (38.0), d-cadinene (10.6), S-guaiazulene (8.6) and unidentified resin (2.3%) (*Riechststoffe Aromen* 1962, 12, 149; *Chem. Abstr* 1962, 57, 4776 i).

LATHYRUS (Papilionaceae)

L. odoratus L.

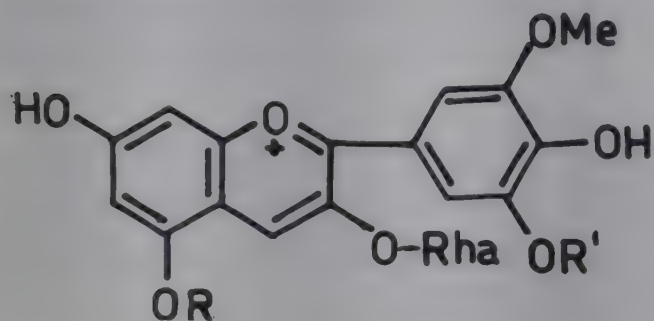
Eng. - Sweet pea.

Seeds fed to rats caused early skeletal and vascular changes, interference with growth, lesions of smaller blood vessels, raising of periosteum, formation of exostoses and osteoporosis (*J. Bone Joint Surg.* 1959, 41B, 600; *Chem. Abstr.* 1960, 54, 14462 h).

Nineteen anthocyanins and three flavonol glycosides isolated from three deeply pigmented varieties of flowers; pelargonidin-3-rhamnoside, -5-glucosido-3-rhamnoside, -3-glucoside, -3-xylosylglucoside and -3,5-diglucoside; peonidin-3-rhamnoside, -5-glucosido-3-rhamnoside, -3-glucoside, -3-xylosylglucoside and -3,5-diglucoside; kaempferol and quercetin 3-rhamnosides; delphinidin, petunidin and their 3-rhamnosides; malvidin-5-glucosido-3-rhamnoside, cyanidin, kaempferol, quercetin and myricetin-3-rhamnoside (*Nature* 1960, 187, 240); 3,7-dirhamnoside and two other 3,7-glycosides of kaempferol isolated from flowers (*Chem. Ind.* 1962, 222); allantoin and arbutin detected (*Rev. Med.* 1965, 11, 405; *Chem. Abstr.* 1966, 64, 16284 e).

Distribution : Indigenous to Italy, grown in Indian gardens.

NEW COMPOUNDS

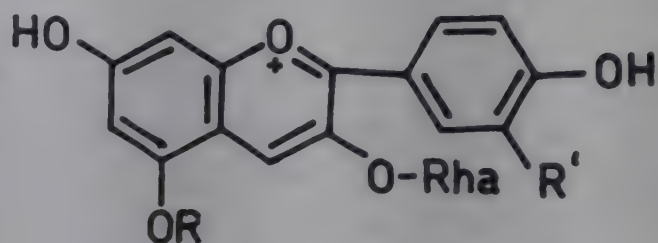


Malvidin-5-glucosido-3-rhamnoside

R = Glu, R' = Me

Petunidin-3-rhamnoside

R = H, R' = H



Peonidin-3-rhamnoside

R = H, R' = OMe

Peonidin-5-glucosido-3-rhamnoside

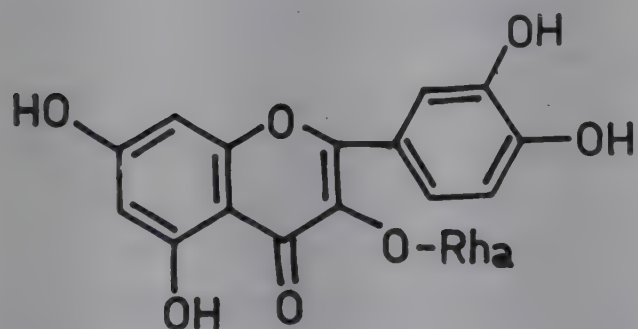
R = Glu, R' = OMe

Pelargonidin-3-rhamnoside

R = H, R' = H

Pelargonidin-5-glucosido-3-rhamnoside

R = Glu, R' = H

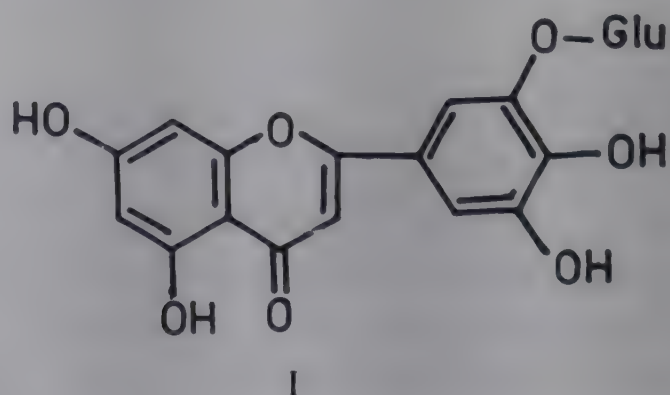


Quercetin-3-rhamnoside

L. pratensis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 150).

Isolation and characterisation of 3',4',5,5',7-pentahydroxyflavone-3'-glucoside (I) (*Acta Pol. Pharm.* 1967, 24, 339; *Chem. Abstr.* 1968, 68, 934698 b); *Tetrahedron Lett.* 1968, 1419).

NEW COMPOUNDS



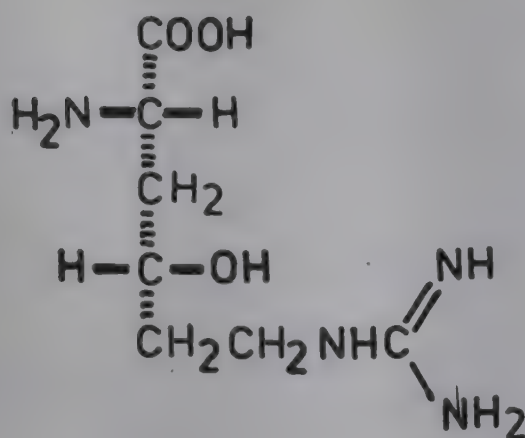
L. tingitanus L.

Eng. - Tangier pea

Putrescine (0.014%) and a new guanidino-amino acid characterised as γ -hydroxyhomoarginine from seeds (*Biochem. Biophys. Res. Commun.* 1963, 13, 49; *Chem. Abstr.* 1964, 60, 850 a).

Distribution : Native of North Africa, cultivated in India.

NEW COMPOUNDS

 γ -Hydroxyhomocitrulline

LAUNAEA (Asteraceae)

L. pinnatifida Cass.; see *L. sarmentosa* (Willd.) Alston

L. sarmentosa (Willd.) Alston syn. *L. pinnatifida* Cass. (*Glossary Indian Med Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 150).

Taraxasterol and taraxeryl acetate from leaves and roots respectively (*J. Indian Chem. Soc.* 1969, 46, 174).

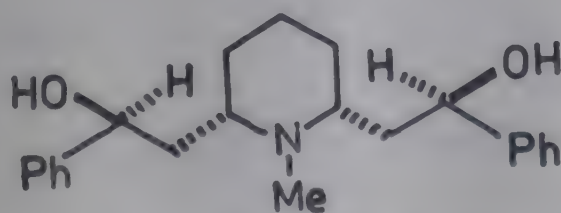
LAURENTIA (Campanulaceae)

L. longiflora (L.) Endl. syn. *Isotoma longiflora* Presl.

(-)-Lobeline, mp. 130°, lobelanidine, mp. 150°, lobelanine and a new alkaloid - (-)-cis-8,10-diphenyllobelidiol, mp. 117° - isolated from herb (*J. Chem. Soc. C* 1963, 750; *Trib. Farm.* 1967, 35, 63; *Chem. Abstr.* 1969, 70, 109119 s).

Distribution : Maharashtra.

NEW COMPOUNDS



cis-8,10-Diphenyllobelidiol

LAURUS (Lauraceae)

L. nobilis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 150).

Leaf oil contained β -pinene, camphene, myrcene, limonene, p-cymene, β -phellandrene, β -selinene and γ -, δ -cadinenes (*Collect. Czech. Chem. Commun.* 1965, 30, 917).

LAVENDULA (Lamiaceae)

L. angustifolia Mill.; see *L. vera* DC.

L. officinalis Chaix.; see *L. vera* DC.

L. spica Loisel.; see *L. vera* DC.

L. stoechas L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 151).

A new triterpene - lavanol, mp. 282° - isolated from plant (*Pakistan J. Sci. Ind. Res.* 1967, 10, 164; (*Chem. Abstr.* 1968, 69, 59434 x); β -sitosterol, ursolic acid and an unidentified acid isolated (*Indian J. Pharm.* 1968, 30, 213).

L. vera DC. syn. *L. angustifolia* Mill., *L. officinalis* Chaix., *L. spica* Loisel.

Eng. - Lavender.

Lavender oil contained β -farnesene, β -bisabolene, caryophyllene, δ -cadinene, γ -cadinene and probably α -farnesene (*Bull. Soc. Chim. Fr.* 1967, 3038).

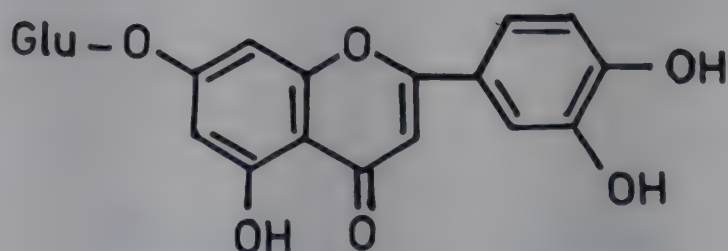
Distribution : Native of southern Europe, now grown in Jammu & Kashmir and Nilgiris.

LEMNA (Lemnaceae)

L. minor L.

Luteolin-7- β -D-glucopyranoside isolated (*Farm. Zh.* 1966, 21, 52; *Chem. Abstr.* 1966, 65, 5301 b).

Distribution : Throughout plains of India.

NEW COMPOUNDS

Luteolin-7- β -D-glucopyranoside

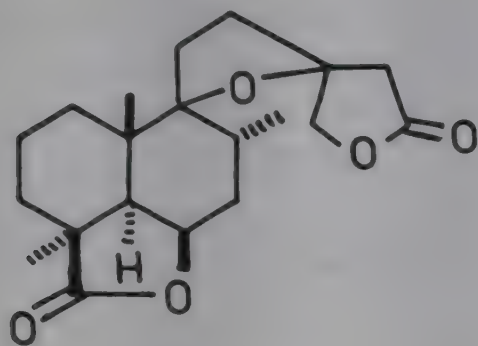
LEONOTIS (Lamiaceae)

L. leonurus R. Br.

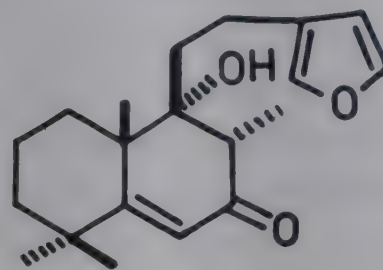
Isolation of marrubiin (0.4), mp. 160° , compound X (0.5), mp. 234° and compound Y (0.5%), mp. 116° , from leaves (*J. South African Chem. Inst.* 1962, 15, 29; *Chem. Abstr.* 1964, 61, 8628 a; *J. Chem. Soc.* 1964, 1857); structures of compounds X and Y elucidated (*J. Chem. Soc. C* 1968, 262).

Distribution : Native of South Africa, grown in Indian gardens.

NEW COMPOUNDS



Compound X



Compound Y

LEONURUS (Lamiaceae)

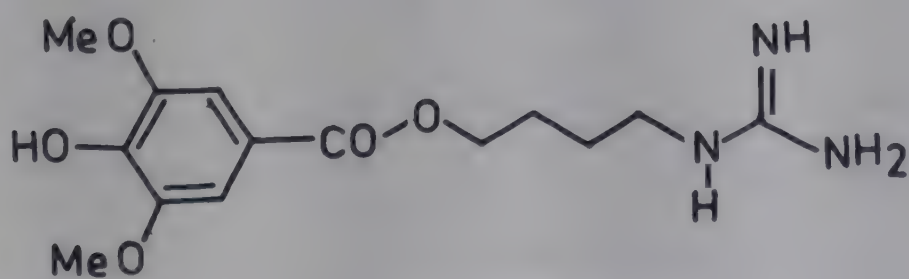
L. cardiaca L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 152).

Stachydrine (0.055%), mp. 235° , isolated from plant (*Acta Pol. Pharm.* 1960, 17, 13; *Chem. Abstr* 1960, 54, 13547 f); presence of two alkaloids indicated by PC (*Ann. Pharm. Fr.* 1961, 19, 341; *Chem. Abstr.* 1962, 56, 4865 g); three bitter glycosides, mp. 96° , 151° and 86° , isolated (*Arzneim. Forsch.* 1961, 11, 830, 975).

L. sibiricus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 152).

Isolation of leonurine (0.02-0.04%), mp. 238° , from leaves and its characterisation and synthesis (*Yakugaku Zasshi* 1962, 82, 1020; *Chem. Abstr.* 1963, 58, 4605 g; *Tetrahedron Lett.* 1962, 545; *Yakugaku Zasshi* 1963, 83, 271; *Chem. Abstr.* 1963, 59, 5215 d).

NEW COMPOUNDS



Leonurine

LEPIDIUM (Brassicaceae)

L. sativum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 152).

A glycoside present in seeds, but absent in seed oil (*Sci. Cult.* 1962, 28, 283).

LEPTADENIA (Asclepiadaceae)

L. reticulata (Retz.) W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 153).

Aqueous extract showed prolonged and pronounced hypotensive effect both in intact and spinal dogs. It did not block carotid sinus reflex on intracisternal administration and caused marked and prolonged rise in arterial pressure. It did not possess parasympathomimetic or adrenolytic actions but blocked pressor response to nicotine. It showed transient negative inotropic and chronotropic effects in dog heart. It caused significant vasodilation in hind limb of dog. It caused initial stimulation, followed by depression of respiration and slight constriction of bronchial muscle. It did not show any acute or chronic toxicity in rats in doses upto 6 ml/kg (*Indian J. Med. Res.* 1960, 48, 457).

LEPTORHABDOS (Scrophulariaceae)

L. benthamiana Walp.; see *L. parviflora* (Benth.) Benth.

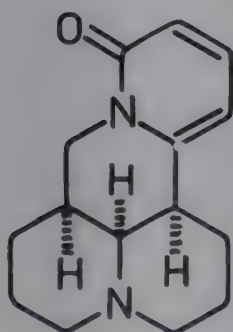
L. linifolia Walp.; see *L. parviflora* (Benth.) Benth.

L. parviflora (Benth.) Benth. syn. *L. benthamiana* Walp.; *L. linifolia* Walp.

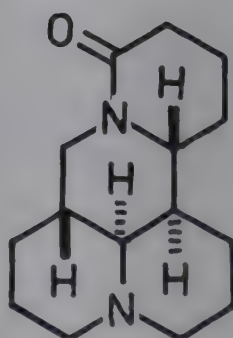
Sophoridine, pachycarpine, sophoramine, sophocarpine, aloperine and two new alkaloids isolated (*Zh. Obshch. Khim.* 1964, 34, 1025; *Chem. Abstr.* 1964, 60, 16214 h).

Distribution : Western Himalayas from Kashmir to Kumaon, alt. 1500-3500 m.

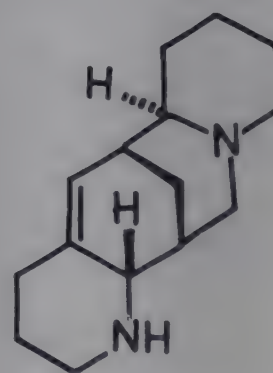
NEW COMPOUNDS



Sophoramine



Sophoridine



Aloperine

LESPEDeza (Papilionaceae)

L. tomentosa (Thunb.) Sieb. ex Maxim

Trifolin isolated (*Khim. Pri. Soedin* 1966, 2, 287; *Chem. Abstr.* 1966, 65, 20509 c).

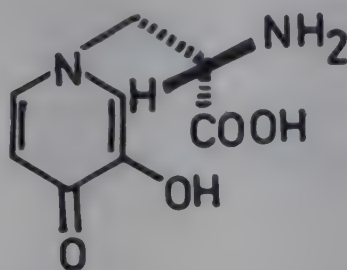
Distribution : Himalayas from Kashmir to western Nepal, alt. 1800-2000 m.

LEUCAENA (Mimosaceae)

L. glauca (L.) Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 153).

A galactomannoglycan (24%) from seeds (*J. Org. Chem.* 1961, 26, 3097); absolute configuration of (-)-mimosine, mp. 226°, isolated from seeds (*Rec. Trav. Chim.* 1964, 83, 1078; *Chem. Abstr.* 1965, 62, 3929 c).

NEW COMPOUNDS



(-)Mimosine

LEUCAS (Lamiaceae)

L. aspera (Willd.) Link (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 153).

Two sterols, mp. 130° and 135°, two alkaloids, mp. 183° and 139°, and galactose isolated (*J. Inst. Chemists*, Calcutta 1969, 41, 98; *Chem. Abstr.* 1969, 71, 78134 g); oleanolic acid, ursolic acid and β -sitosterol isolated (*J. Indian Chem. Soc.* 1969, 46, 95).

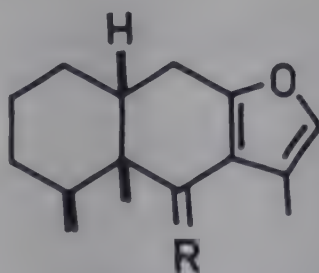
LIGULARIA (Asteraceae)

L. sibirica (L.) Cass. syn. *Senecio ligularia* Hook.f., p.p.

Two sesquiterpenes - ligularol and ligularone - isolated and characterised as 6 β -hydroxyfurano-eremophilane and 6-oxofurano-eremophilane respectively (*Tetrahedron* 1965, 21, 2605).

Distribution : Himalayas from Kashmir to Kumaon, alt. 2500-3500 m.

NEW COMPOUNDS



Ligularol

R = β -OH, H

Ligularone

R = O

LIMNANTHEMUM (Gentianaceae)

L. nymphaeoides Hoffm. & Link; see *Nymphoides peltatum* (S.G. Gmel.) Kuntze

LIMONIA (Rutaceae)

L. acidissima auct. (non. L.); see *Naringi crenulata* (Roxb.) Nicolson

L. crenulata Roxb.; see *Naringi crenulata* (Roxb.) Nicolson

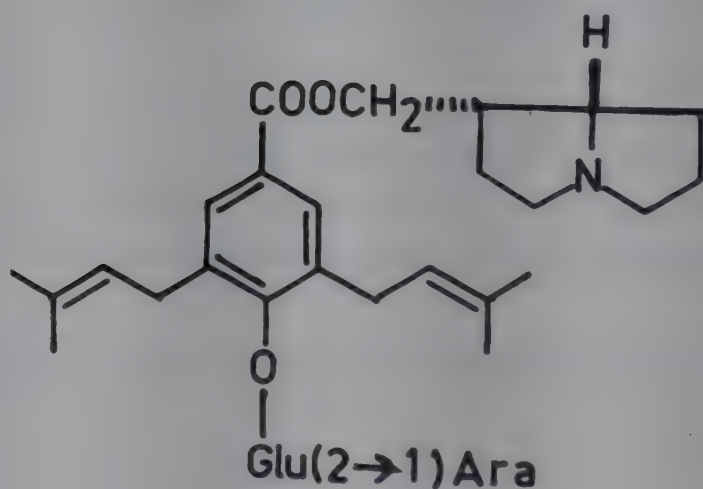
Note : *L. acidissima* L. dealt in Hook.f. FBI 1, 507 is presently called *Naringi crenulata* (Roxb.) Nicolson.

LIPARIS (Orchidaceae)

L. nervosa (Sw.) Lindl.

Nervosine isolated and characterised (*Tetrahedron* 1969, 25, 2723).

Distribution : Punjab, Kumaon, Khasi Hills, Bengal and western Peninsula.

NEW COMPOUNDS

Nervosine

LIPPIA (Verbenaceae)

L. nodiflora Mich.; see *Phyla nodiflora* (L.) Greene

LIRIODENDRON (Magnoliaceae)

L. tulipifera L.

Eng. - Tulip tree; Trade - White wood, Canary wood.

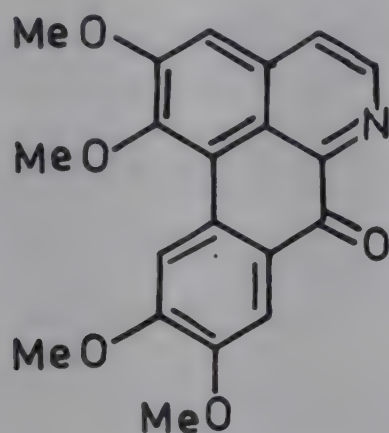
Extract of root bark showed significant anticancer activity in KB cell culture (*J. Pharm. Sci.* 1969, 58, 877).

Isolation of liriodenine, mp. 272° and its tetramethoxy analog from heartwood; structure elucidation of latter as 1,2,9,10-tetramethoxydibenz[de,g]-quinolin-7-one and its synthesis; d-glaucine, mp. 122°, shown to be major alkaloid of heartwood (*Tetrahedron* 1961, 14, 42;

J. Org. Chem. 1961, 26, 4143; *Yakugaku Zasshi* 1962, 82, 1199; *Chem. Abstr.* 1962, 57, 17079 c); esculetin dimethyl ether isolated from cortex (*Yakugaku Zasshi* 1962, 82, 1199; *Chem. Abstr.* 1962, 57, 17079 c); cytotoxic germacranolides - costunolide and tulipinolide - isolated (*J. Pharm. Sci.* 1969, 58, 877).

Distribution : Native of eastern North America, introduced in some hill stations in India.

NEW COMPOUNDS



Tetramethoxyiriodenine

LITHOSPERMUM (Boraginaceae)

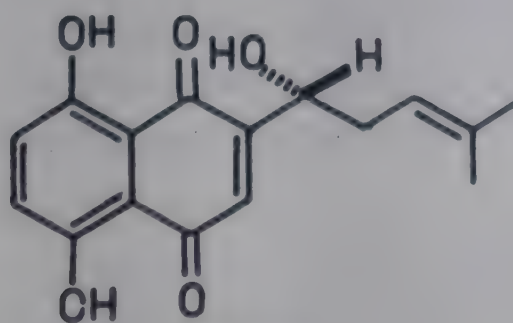
L. arvensis L. (*arvense*) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 155).

n-Triacontane, ceryl alcohol, palmitic, oleic, linoleic and cerotic acids from herb (*Diss. Pharm. Pharmacol.* 1966, 18, 157; *Chem. Abstr.* 1966, 65, 5870 b); rutin (0.59%) isolated (*Farm. Zh.* 1967, 22, 58; *Chem. Abstr.* 1967, 67, 51033 d).

L. officinale L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 155).

Non-saponifiable matter from root of Japanese var. *erithorhizon* contained valeric and isovaleric acids (*Syoyakugaku Zasshi* 1963, 17, 45; *Chem Abstr.* 1965, 62, 3065 c); isolation of an octadeca- 4,8,12,15-tetraenoic acid from fruits (*Biochem. Z* 1963, 339, 212; *Chem. Abstr.* 1964, 60, 7138 c; *Arzneim. Forsch.* 1964, 14, 34); isolation of scyllitol from plant and caffeic, chlorogenic and ellagic acids and amino acids from leaves (*Arzneim. Forsch.* 1964, 14, 34); shikonin (0.1%) (*Khim. Prir. Soedin.* 1966, 2, 359; *Chem. Abstr.* 1967, 66, 79524 t); rutin (0.54%) isolated (*Farm. Zh.* 1967, 22, 58; *Chem. Abstr.* 1967, 67, 51033 d).

NEW COMPOUNDS



Shikonin

LITSEA (Lauraceae)

L. citrata Bl.; see *L. cubeba* (Lour.) Pers.

L. consimilis (Nees) Nees; see *Neolitsea pallens* (D. Don) Momiyama & Hara

L. cubeba (Lour.) Pers. syn. *L. citrata* Bl. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 155).

Essential oil from fruits contained (+)limonene (6.0), (-)sabinene (7.0), methylheptenone (2.5), citronellal (1.0) and citrals (80%) (*C.R. Acad. Sci. Paris*, Ser. D 1959, 248, 2029; *Chem. Abstr.* 1960, 54, 13558 b); furfural, formaldehyde, acetone, butyraldehyde, isovaleraldehyde, methylheptenone, citral and citronellal identified in essential oil (*Riechstoffs Aromen. Koerpfliegemittel* 1964, 14, 317; *Chem. Abstr.* 1965, 62, 3880 d).

L. lanuginosa (Wall. ex Nees) Nees; see *Neolitsea cuipala* (D. Don) Kostermans

L. monopetala (Roxb.) Pers. syn. *L. polyantha* Juss. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 155).

β -Sitosterol and actinodaphnine from bark (*J. Indian Chem. Soc.* 1968, 45, 987).

L. polyantha Juss.; see *L. monopetala* (Roxb.) Pers.

L. umbrosa Nees var. *consimilis* (Nees) Hook.f.; see *Neolitsea pallens* (D. Don.) Momiyama & Hara

L. zeylanica Nees; see *Neolitsea cassia* (L.) Kostermans

LOBARIA (Stictaceae)

L. retigera (Bory) Trev.

Stictic acid, thelephoric acid, D-arabitol and D-mannitol isolated (*Curr. Sci.* 1966, 35, 146).
Distribution : Throughout temperate Himalayas.

LOBELIA (Lobeliaceae)

L. inflata L.

Eng. - Lobelia.

Absolute configuration and synthesis of (+)8-phenylnorlobelol (2S :8R) [(+)norallosedamine] (*Ann. Chem.* 1959, 628, 101); sedinine characterised as trans-8-methyl-10-phenyl-4,5-dehydrolobelidiol (*Chem. Ber.* 1960, 93, 2360); (+)lobeline, mp. 131°, (+)trans-lobeline, lobelanine and lobelanidine isolated (*Chem. Zvesti* 1963, 17, 795; *Chem. Abstr.* 1964, 60, 9099 d; *Tribuna Farm.* 1964, 32, 64; *Chem. Abstr.* 1965, 63, 17798 g).

Distribution : Indigenous to eastern U.S.A. and Canada, introduced into India in Darjeeling and Nilgiris.

NEW COMPOUNDS



L. pyramidalis Wall.

Lushai - Berawchal.

Lobelinic acid, mp. 226° and lobeline (0.2%) isolated (*Madhya Bharati* Pt. II, Sec. A 1960, 9, 29; *Chem. Abstr.* 1964, 60, 3265 e).

Distribution : Himalayas from Garhwal to Sikkim and Aka, Lushai and Khasi Hills, alt. 900-2700 m.

LOCHNERA (Apocynaceae)

L. pusilla (Murr.) K. Schum.; see *Catharanthus pusillus* (Murr.) G. Don

L. rosea (L.) Reichb.; see *Catharanthus roseus* (L.) G. Don

LOLIUM (Poaceae)

L. perenne L.

Eng. - Perennial rye grass.

Loliolide, mp. 148°, isolated from leaves and its structure assigned (*Tetrahedron* 1964, 20, 1463; *Chem. Pharm. Bull.* 1965, 13, 43); perloline shown to be normal constituent of plant growing in Britain (*J. Chem. Soc.* 1964, 4504); synthesis of perlolidine (*J. Chem. Soc. C* 1967, 859); a xylan composed of arabinose, xylose and aldobiouronic acid isolated from rye grass (*J. Chem. Soc. C* 1967, 1577).

Distribution : Temperate western and eastern Himalayas alt. 2000-4500 m, Pulney Hills and the Nilgiris.

LONICERA (Caprifoliaceae)

L. japonica Thunb.

Eng. - Japanese honeysuckle; Lushai - Leihruisen.

Lonicerin (0.01%), mp. 218°, isolated from leaves and identified as luteolin-7-rhamnoglucoside (*Yakugaku Zasshi* 1961, 81, 558; *Chem. Abstr.* 1961, 55, 19914 c).

Distribution : Lushai Hills in Meghalaya at about 750 m. Also grown in gardens as ornamental.

L. periclymenum L.

Eng. - Woodbine honeysuckle.

1,8-Cineol, limonene, myrcene, alloocimene, α - and β -pinene, β -sitosterol and n-alkanes from neutral fraction of wood extract, and all normal fatty acids from lauric to stearic,

n- eicosanoic and palmitic acids from free acid fraction (*Perfum. Essent. Oil Record* 1965, 56, 15; *Chem. Abstr.* 1965, 62, 9461 g).

Distribution : Grown as ornamental in hill stations.

LORANTHUS (Loranthaceae)

L. longiflorus Desr.; see *Dendrophthoe falcata* (L.f.) Ettingshausen

LOTUS (Papilionaceae)

L. corniculatus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 156).

Leucodelphinidin, quercetin, leucocyanidin, kaempferol, p-coumaric acid and ferulic acid from leaves (*Am. J. Bot.* 1964, 51, 621; *Chem. Abstr.* 1964, 61, 16434 c); quercetagenin-3-galactoside from flowers (*Phytochemistry* 1965, 4, 647).

LUFFA (Cucurbitaceae)

L. acutangula (L.) Roxb. var. *amara* (Roxb.) Clarke syn. *L. amara* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 156).

Amarin identified as cucurbitacin B (*Chem. Ind.* 1959, 1119; *J. Sci. Ind. Res.* 1959, 18B, 535).

L. aegyptiaca Mill. ex Hook.f.; see *L. cylindrica* (L.) M. Roem.

L. amara Roxb.; see *L. acutangula* (L.) Roxb. var. *amara* (Roxb.) Clarke

L. cylindrica (L.) M. Roem. syn. *L. aegyptiaca* Mill. ex Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 157).

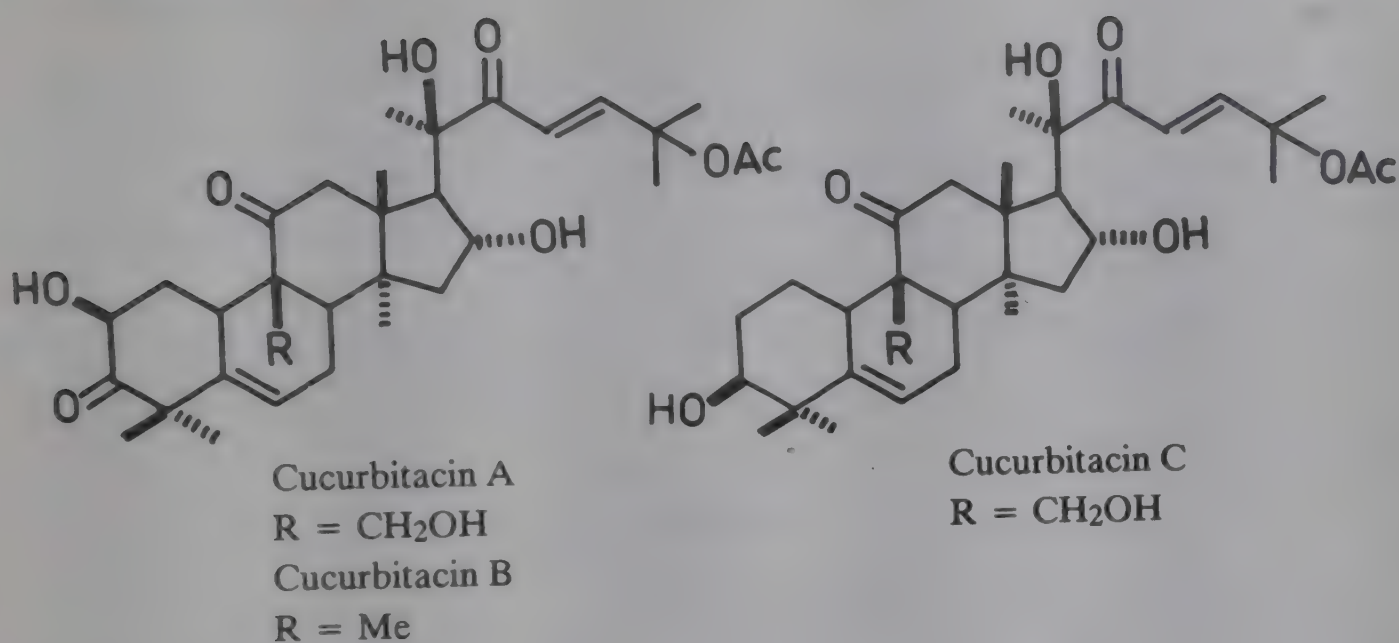
Saponin from seeds on hydrolysis gave oleanolic acid and a neutral genin (*Trans. Bose. Res. Inst. Calcutta* 1956-58, 21, 19; *Chem. Abstr.* 1960, 54, 1954 g; *J. Sci. Ind. Res.* 1960, 19B, 507); α -spinasterol, mp. 174°, from unsaponified fraction of seed oil (*Indian J. Chem.* 1965, 3, 423); acetyl gypsogenin and its lactone isolated from seeds (*Aust. J. Chem.* 1965, 18, 1689).

L. echinata Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 157).

Aqueous and alcoholic extracts of seeds possess anthelmintic activity (*Indian J. Med. Sci.* 1965, 19, 398). Ingestion by rats afflicted with experimental jaundice (induced by 2.5 mg/kg of chlorpromazine), of aqueous extract of fruits corresponding to 25 and 50 mg of crude preparation decreased serum bilirubin in 48-72 hrs. (*Indian J. Physiol. Pharmacol.* 1965, 12, 119).

Cucurbitacin B(3.5), mp. 176°, cucurbitacin E (0.05%), mp. 234° and a bitter saponin composed of a triterpene acid, glucose, arabinose and rhamnose, from fruits (*J. Sci. Ind. Res.* 1961, 20B, 360; *ibid.* 1961, 20B, 556); cucurbitacin B, β -sitosterol, two unidentified triterpene alcohols - echinatol A, mp. 144° and echinatol B, mp. 167° - from seeds (*J. Sci. Ind. Res.* 1961, 20B, 556); constitution of cucurbitacin B established; structures of cucurbitacins A and C proposed (*Tetrahedron Lett.* 1962, 309; *J. Chem. Soc.* 1963, 3282; *ibid.* 1963, 3828).

NEW COMPOUNDS

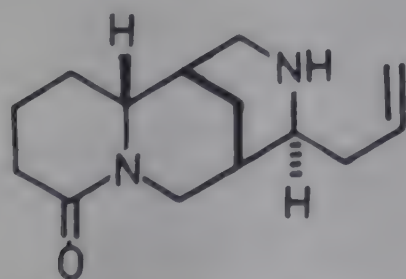


LUPINUS (Papilionaceae)

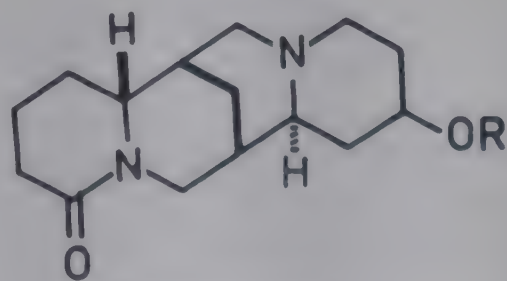
L. albus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 157).

Angustifoline and two alkaloids different from known lupin alkaloids, isolated from seeds (*Rocz. Chem.* 1959, 33, 1187; *Chem. Abstr.* 1960, 54, 9979 i); detection of lupanine, hydroxylupanine, sparteine and two unidentified bases in various parts of plant by PC (*Acta Soc. Bot. Pol.* 1959, 28, 285; *Chem. Abstr.* 1960, 54, 10237 i); constitution of angustifoline (*Chem. Ber.* 1960, 93, 1956); a new method of isolation of alkaloids (*Bull. Acad. Pol. Sci. Ser. Sci. Chim.* 1960, 8, 45; *Chem. Abstr.* 1961, 55, 4887 d); structures of three new acyloxylupanines as esters of tiglic, cinnamic and benzoic acids (*Bull. Acad. Pol. Sci. Ser. Sci. Chim.* 1963, 11, 629; *Chem. Abstr.* 1964, 60, 10737 a); a galactan from seeds (*Biochem. J.* 1966, 100, 33).

NEW COMPOUNDS



Angustifoline

Acyloxylupanine
R = Cinnamoyl/Benzoyl/Tigloyl

BIOLOGICAL ACTIVITY

MLD of sparteine oral and i.v. were 32 mg/kg and 810 mg/kg respectively. Sparteine, lupanine and lupinine were not attacked by liver enzymes and appeared almost quantitatively in urine and faeces (*Rocz. Nauk Rolniczych* 1960, 75, 385; *Chem. Abstr.* 1961, 55, 9663 c).

L. angustifolius L.

Eng. - Blue lupin.

New alkaloids, mp. 95° and 102° , angustifoline and (+)oxolupanine isolated (*Rocz. Chem.* 1959, 33, 1187, 1195; *Chem. Abstr.* 1960, 54, 9979 i); structures of three new acyloxylupanines as esters of tiglic, cis- and trans-cinnamic acids, elucidated (*Bull. Acad. Pol. Sci. Ser. Sci. Chim.* 1963, 11, 629; *Chem. Abstr.* 1964, 60, 10737 a); β -sitosterol and its isomer, mp. 140° , from seeds (*Rocz. Chem.* 1964, 38, 243; *Chem. Abstr.* 1964, 60, 14566 a).

Distribution : Native of Mediterranean region, introduced into India as green manure plant in Nilgiris.

LUVUNGA (Rutaceae)

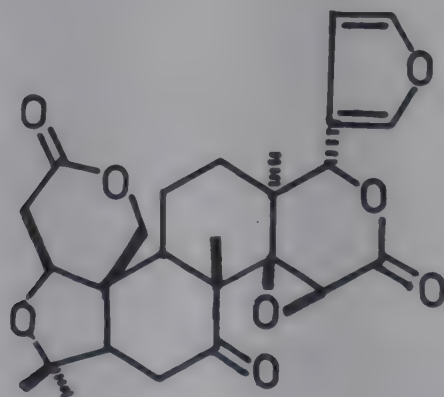
L. eleutherandra Dalz.; see *L. sarmentosa* (Bl.) Kurz.

L. sarmentosa (Bl.) Kurz. syn. *L. eleutherandra* Dalz.

Isolation of ostruthin, mp. 114° , limonin, mp. 291° from alkali soluble fraction and xanthyletin, mp. 120° from neutral fraction of plant extract (*Indian J. Chem.* 1966, 4, 292); crystal structure of limonin (*J. Chem. Soc.* 1961, 4183).

Distribution : Western part of peninsular India, from Konkan southwards to Annamalai and Travancore hills upto 1000 m.

NEW COMPOUNDS

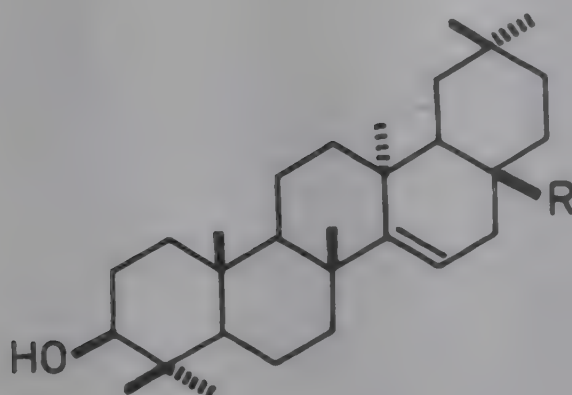


Limonin

L. scandens (Roxb.) Buch.-Ham. ex Wight (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 157).

Myricardiol, mp. 262° , taraxerol and myricolal from bark (*J. Indian Chem. Soc.* 1967, 44, 659).

NEW COMPOUNDS



Myricardiol

R = CH₂OH

Myricolal

R = CHO

LYCHNIS (Caryophyllaceae)

L. githago (L.) Scop.; see *Agrostemma githago* L.

LYCIUM (Solanaceae)

L. europaeum L.

Lyceamine, mp. 280° and β -sitosterol from aerial parts (*Pakistan J. Sci. Ind. Res.* 1968, 11, 247; *Chem. Abstr.* 1969, 70, 777 z).

Distribution : Punjab, Rajasthan, Gujarat, Saurashtra and Khasi Hills, ascending to 1500 m.

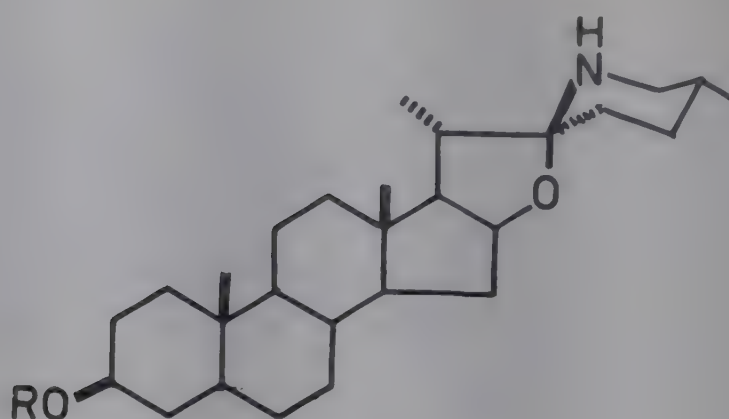
LYCOPERSICON (Solanaceae)

L. esculentum Mill.; see *L. lycopersicum* (L.) Karsten

L. lycopersicum (L.) Karsten syn. *L. esculentum* Mill., *Solanun lycopersicum* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 158).

Preparation of crude tomatine from drug (Czech. 96,718 (1960), Sept. 15; *Chem. Abstr.* 1961, 55, 21493 a); β 1-tomatine (0.81%) identified as main alkaloid in some experimentally-produced mutants of plant (*Kulturpflanze* 1963, 11, 502; *Chem. Abstr.* 1964, 60, 13095 h); tomatine, mp. 278°, isolated (*Ann. Pharm. Fr.* 1967, 25, 621; *Chem. Abstr.* 1968, 68, 33132 b).

NEW COMPOUNDS

 β 1-TomatineR = Glu(4 \rightarrow 1)Glu[(2 \rightarrow 1)Glu](3 \rightarrow 1)Ara

BIOLOGICAL ACTIVITY

Tomatine has antibiotic and fungicidal activities (*Ann. Pharm. Fr.* 1967, 25, 621; *Chem. Abstr.* 1968, 68, 33132 b).

LYCOPODIUM (Lycopodiaceae)

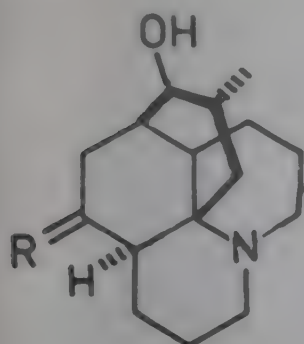
L. cernuum L.; see *Palhinhaea cernua* (L.) Franco & Vase.

L. clavatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 158).

Fawcettiine, mp. 272° and clavolonine, mp. 238°, isolated and structures elucidated (*Chem. Ind.* 1960, 1239; *Can. J. Chem.* 1961, 39, 1090; *Tetrahedron* 1961, 15, 173); fawcettimine, lycopodine, mp. 117°, dihydrolycopodine, deacetylfawcettiine, mp. 205° and an unstable base isolated as picrate, from Jamaican plant (*Can. J. Chem.* 1961, 39, 1090; *ibid.* 1963, 41, 3091); structure of lycopodine assigned (*Tetrahedron Lett.* 1961, 187); sucrose, α -onocerin, mp. 238° and two new triterpenes - lycoclavanol, mp. 308° and lycolavanin, mp. 344° - isolated and their structures elucidated (*Yakugaku Zasshi* 1962, 82, 1083; *Chem. Abstr.* 1963, 58, 9149 g; *Yakugaku Zasshi* 1962, 82, 1537; *Chem. Abstr.* 1963, 58, 5989 d; *Chem. Pharm. Bull.* 1962, 10, 637; *Chem. Abstr.* 1963, 58, 5983 h); new alkaloids - lycoclavine and its acetate - isolated and their structures elucidated (*Can. J. Chem.* 1962, 40, 2088); structure of clavatine established from its correlation to lycopodine (*Bull. Acad. Polon. Sci. Chim.* 1964, 12, 311; *Chem. Abstr.* 1964, 61, 13358 f); unsaturated fatty acids from spores identified (*Naturwiss.* 1965, 52, 305; *Chem. Abstr.* 1965, 63, 8730 g); 21-episerratriol, mp. 230°, characterised as serrat-14-ene-3 β ,21 β ,24-triol (I) (*Chem. Commun.* 1969, 1040); structures of triterpenoid B3, mp. 300°, triterpenoid B4, mp. 318° and triterpenoid B5, mp. 294°, established as 16-oxoserrat-14-ene-3 β ,21 β -diol, 16-oxoserrat-14-ene-3 α ,21 β -diol and 16-oxoserrat-14-ene-3 β ,21 α -diol respectively (*Chem. Commun.* 1969, 1042).

Note : According to present concept the Indian plant hitherto known as *L. clavatum* L. is *L. japonicum* Thunb.

NEW COMPOUNDS

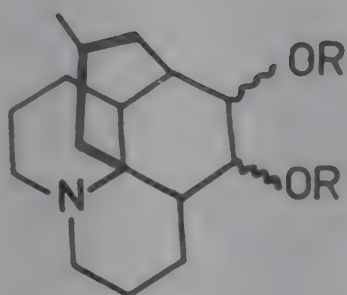


Fawcettiine

R = H, OAc

Clavolonine

R = O

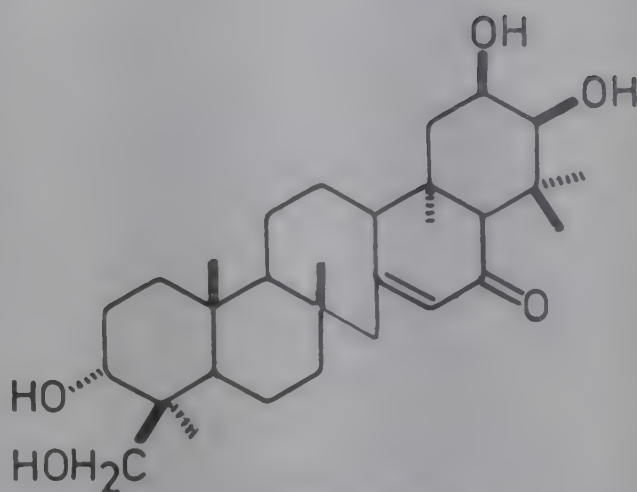


Lycoclavine

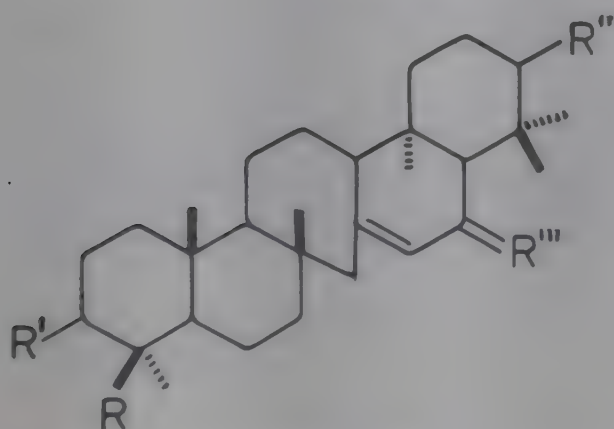
R = H

Acetyllycoclavine

R = Ac R = Ac



Lycoclavanin



21-Episerratriol

R = CH₂OH, R' = β -OH,R'' = β -OH, R''' = H, H

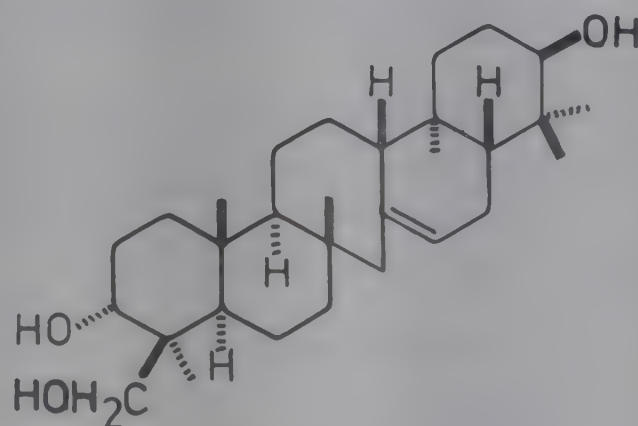
Triterpenoid B3

R = Me, R' = β -OHR' = β -OH, R''' = O

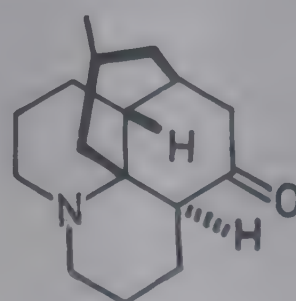
Triterpenoid B4

R = Me, R' = α -OH,R'' = β -OH, R''' = O

Triterpenoid B5

R = Me, R' = β -OH,R'' = α -OH, R''' = O

Lycoclavanol



Lycopodine

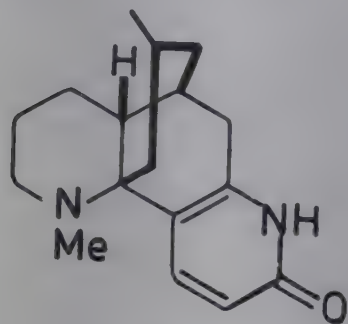
L. selago L.

Nine alkaloids isolated - α -(obscurine), mp. 284°, β -obscurine, mp. 317°, selagine, mp. 215°, alkaloid L-20, mp. 259°, lycopodine, lycodoline, mp. 180°, acrifoline, mp. 103°, pseudoselagine (isolycodoline), mp. 163°, and an unidentified base, mp. 242° (*Rocz. Chem.* 1968, 42, 465; *Chem. Abstr.* 1968, 69, 44976 h).

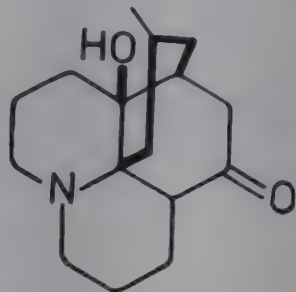
Distribution : Sikkim.

Note : The current valid name for this taxon is *Huperzia selago* (L.) Bernh. ex Schrank & Mart.

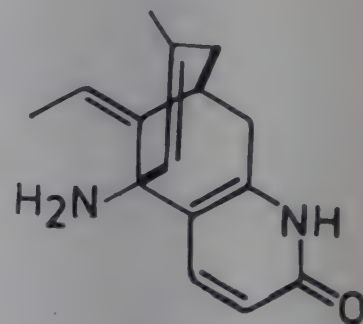
NEW COMPOUNDS



β -Obscurine



Lycodoline



Selagine

LYCOPUS (Labiatae)

L. europaeus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 158).

Luteolin-7-monoglucoside, mp. 254°, along with free glucose and galactose isolated; ursolic, caffeic, chlorogenic, sinapic and ellagic acids and alanine, tyrosine, serine, valine, leucine, isoleucine, lysine, glycine, threonine, phenylalanine, glutamic acid, aspartic acid identified (*Arzneim. Forsch.* 1962, 12, 1).

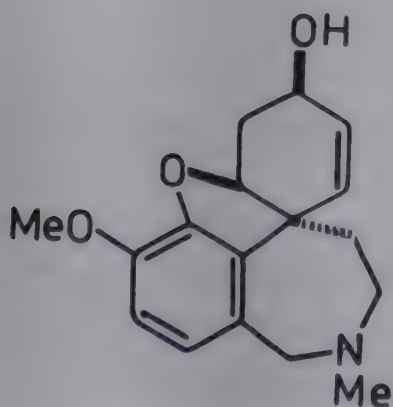
LYCORIS (Amaryllidaceae)

L. aurea Herbert

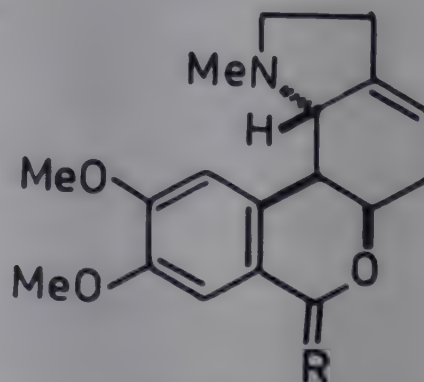
Seven alkaloids - lycorine, pseudolycorine, homolycorine, squamigerine, galanthamine, lycoramine and lycorenine - isolated (Yao Hsueh Hsueh Pao 1964, 11, 1; *Chem. Abstr.* 1964, 61, 3154 d); crystal structure of galanthamine (*Proc. Chem. Soc.* 1964, 357); absolute configuration of lycorine (*Tetrahedron Lett.* 1966, 2009); total synthesis of lycoramine (*J. Chem. Soc. C.* 1968, 2947); crystal structure of lycorenine (*J. Org. Chem.* 1972, 37, 49).

Distribution : Grown in gardens as ornamental.

NEW COMPOUNDS



Galanthamine

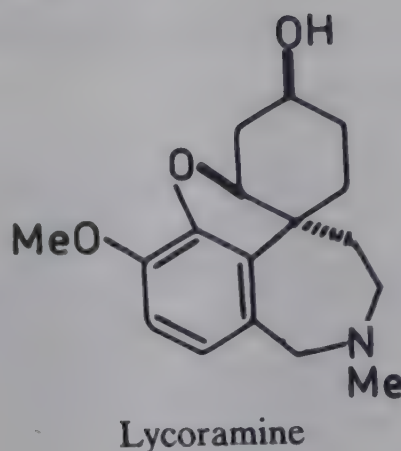


Homolycorine

R = O

Lycorenine

R = H, α -OH

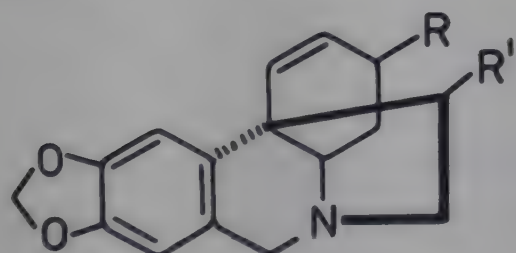


L. radiata (L'Herit.) Herbert

A glucofructan from bulbs on hydrolysis yielded fructobiose, fructotriose, fructotetrose and fructopentose (Kogaku 1961, 31, 146; Chem. Abstr. 1961, 55, 27099 e); seven alkaloids - lycorine, pseudolycorine, homolycorine, squamigerine, galanthamine, lycoramine and lycorenine - isolated (Yao Hsueh Hsueh Pao 1964, 11, 1; Chem. Abstr. 1964, 61, 3154 d); ethyl radiatine, mp. 171° from rhizomes (Yakugaku Zasshi 1965, 85, 615; Chem. Abstr. 1965, 63, 11632 f); vittatine, mp. 206° (optical antipode of crinine) and haemanthamine, mp. 203° - isolated and characterised (Chem. Pharm. Bull. 1966, 14, 793); crystal structure of haemanthamine (J. Am. Chem. Soc. 1970, 92, 6337).

Distribution : Grown in gardens as ornamental.

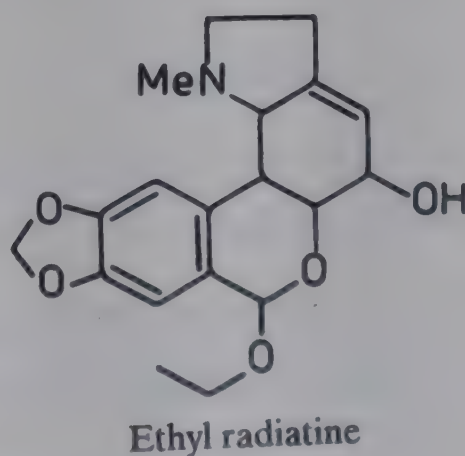
NEW COMPOUNDS



$R = \alpha\text{-OH}, R' = \text{H}$

Haemanthamine

$R = \beta\text{-OMe}, R' = \text{OH}$



BIOLOGICAL ACTIVITY

Lycorine and lycorenine were compared pharmacologically. Lycorine caused decrease of spontaneous motility and respiratory depression followed by death in rabbits. Same symptoms were observed with lycorenine but it was less toxic. Lycorine had a depressive effect on CNS and produced mild hypotension, whereas lycorenine exerted relatively continuous hypotensive action even in small doses. The former caused peripheral vasodilation and depressed cardiac movements, while the latter did not produce vasodilation and increased contractive force of isolated heart (Yakugaku Kenkyu 1962, 34, 320; Chem. Abstr. 1963, 58, 859 a); lycorine had no influence on glycolytic enzymes such as hexokinase, phosphorylase and glucose-6-phosphatase; however, inhibition of oxidation of Kreb's cycle intermediates, except succinate,

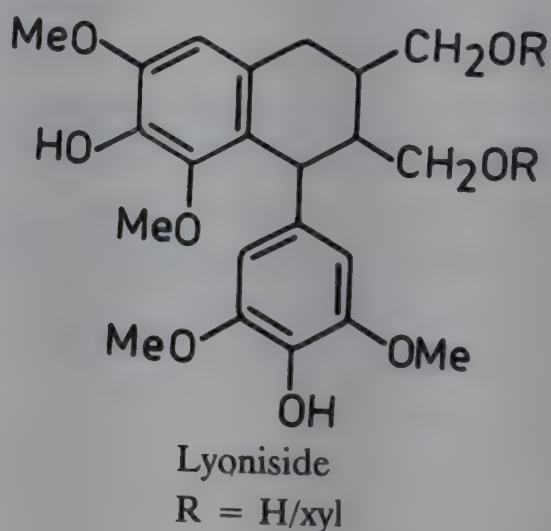
was observed (*Yakugaku Kenkyu* 1962, 34, 373; *Chem. Abstr.* 1963, 58, 7263 e).

LYONIA (Ericaceae)

L. ovalifolia (Wall.) Drude syn. *Pieris ovalifolia* (Wall.) D. Don. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 158).

Putatine, mp. 194°, isolated from leaves (*Nagoya Shiritsu Daigaku Yakugakubu Kiyo* 1960, 8, 35; *Chem. Abstr.* 1961, 55, 16504 e); a new lignan xyloside - lyoniside, mp. 160° - from wood (*Yakugaku Zasshi* 1961, 81, 526; *Chem. Abstr.* 1961, 55, 19870 i); β -sitosterol- β -D-glucoside, ursolic acid and lyofolic acid, mp. 136°, from leaves (*Yakugaku Zasshi* 1967, 87, 581; *Chem. Abstr.* 1967, 67, 108944 h).

NEW COMPOUNDS



MACHILUS (Lauraceae)

M. macrantha Nees; see *Persea macrantha* (Nees) Kosterm.

MACLURA (Urticaceae)

M. aurantiaca Nutt.; see *M. pomifera* (Rafin.) C.K. Schm.

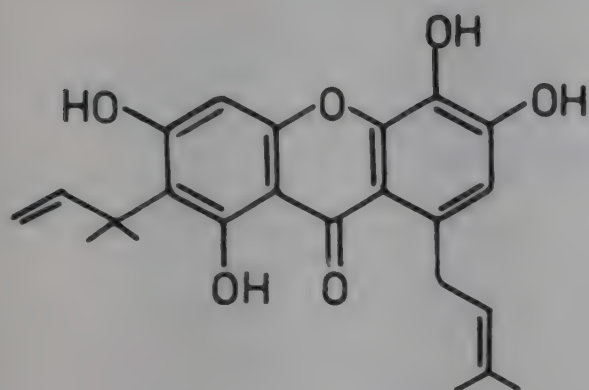
M. pomifera (Rafin.) C. K. Schm. syn. *M. aurantiaca* Nutt.

Eng. - Osage orange.

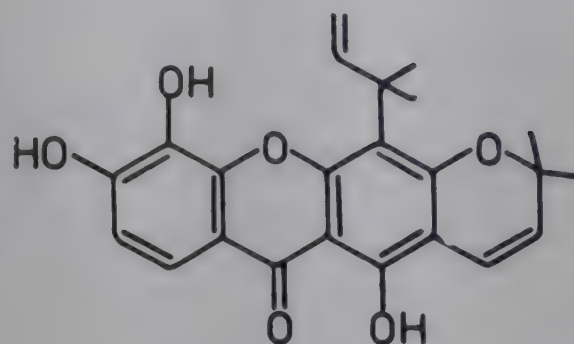
Isolation of isoflavone - osajin (*Med. Prom. SSSR* 1963, 17, 13; *Chem. Abstr.* 1963, 59, 15603 d); a root pigment - macluraxanthone - characterised as 12-(1,1-dimethylallyl)-5,9,10-trihydroxy-2,2-dimethyl-2H,6H-pyrano[3,2-b]xanthen-6-one (*J. Org. Chem.* 1964, 29, 692); another pigment - alvaxanthone - from root bark shown to be 2-(1,1-dimethylallyl)-1,3,5,6-tetrahydroxy-8-(3-methyl-2-butenyl)-xanthen-9-one (*J. Org. Chem.* 1965, 30, 1088); kaempferol-7-glucoside, mp. 268°, found in different parts of plant (*Planta Med.* 1967, 15, 264).

Distribution : Native of North America, introduced into India and grown in gardens.

NEW COMPOUNDS



Alvaxanthone



Macluraxanthone

MADHUCA (Sapotaceae)

M. butyracea (Roxb.) Macbride syn. *Bassia butyracea* Roxb. (*Glossary Indian Med. Plants* Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 159).

A sterol glucoside, mp. 276°, and a flavonoid, mp. 222°, from nuts (*J. Sci. Ind. Res.* 1962, 21D, 102); proanthocyanins consisting of leucocyanidin and oligosaccharide unit (R-O-xylose-arabinose-rhamnose-glucose) isolated (*Curr. Sci.* 1966, 35, 223); α -spinasterol and β -sitosterol- β -D-glucoside, α - and β -amyrin acetates from bark and fruit pulp (*Phytochemistry* 1968, 7, 637).

M. indica J. F. Gmel.; see *M. longifolia* (Koen.) Macbride var. *latifolia* (Roxb.) Cheval.

M. latifolia (Roxb.) Macbride; see *M. longifolia* (Koen.) Macbride var. *latifolia* (Roxb.) Cheval.

M. longifolia (Koen.) Macbride var. *latifolia* (Roxb.) Cheval. syn. *M. latifolia* (Roxb.) Macbride, *M. indica* J. F. Gmel., *Bassia latifolia* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 159).

Sucrose, β -sitosterol and a sterol glucoside from nuts (*J. Sci. Ind. Res.* 1962, 21D, 102); α - and β -amyrin acetates, 3 β -capryloxyerythrodil and 3 β -capryloxyoleanolic acid from fruits; β -sitosterol- β -D-glucoside, quercetin and dihydroquercetin from nut shell (*Phytochemistry* 1967, 6, 121); lupeol acetate, β -amyrin acetate, α -spinasterol, erythrodil monocaprylate, betulinic and oleanolic acids caprylates, xylose, rhamnose, glucose and galactose from bark (*Phytochemistry* 1968, 7, 1433).

MAESA (Myrsinaceae)

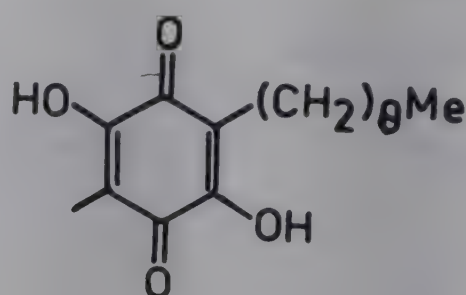
M. macrophylla Wall.

Kumaon - Phusera; Nep. - Bogete; Lepcha - Kalun kung.

Bhogatin, mp. 156°, isolated and characterised as 2,5-dihydroxy-6-methyl-3-nonyl-1,4-benzoquinone (*Curr. Sci.* 1969, 38, 15).

Distribution : Himalayas from Nepal to Bhutan and northern Bengal, alt. 900-1500 m.

NEW COMPOUNDS



Bhogatin

MAGNOLIA (Magnoliaceae)

M. grandiflora L.

Eng. - Bull bay; H. - Andachampa, Himchampa.

Presence of magnoflorine in bark (*Yakugaku Zasshi* 1961, 81, 144; *Chem. Abstr.* 1961, 55, 13772 i); alkaloids - anolobine, mp. 240°, anonaine, N-nornuciferine, mp. 127° and liriodenine, mp. 280°, from wood (*Yakugaku Zasshi* 1967, 87, 1134; *Chem. Abstr.* 1968, 68, 10233 w).

Distribution : Native of North America, grown in gardens and found in Himalayas and Nilgiris upto 2100 m.

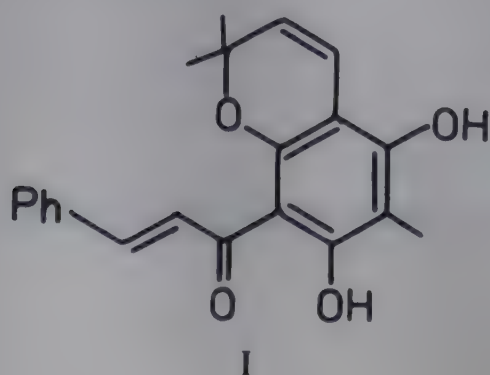
MALLOTUS (Euphorbiaceae)

M. philippinensis (Lam.) Muell.-Arg. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 160).

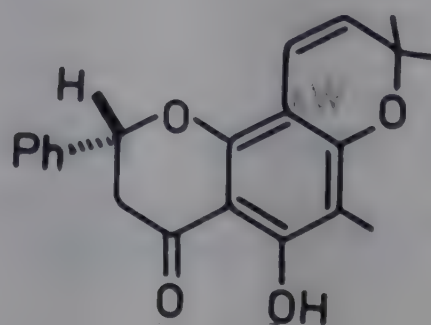
Plant extract lethal to trematodes but not to nematodes. Alcoholic extract was most effective *in vitro* and *in vivo*. Death of worms commenced 60 and 90 min after addition of alcoholic extract (1:100 concentration) and aqueous extract (1:25 concentration) respectively (*Indian J. Med. Res.* 1967, 55, 746).

Known cardenolides - rottlerin, mp. 212° and isorottlerin, mp. 182° - isolated (*Indian J. Med. Res.* 1960, 48, 52); corotoxigenin and its rhamnoside, coroglaucigenin and its rhamnoside isolated from seeds (*Helv. Chim. Acta* 1963, 46, 2886); a C-methylated cinnamoyl chromene (I) and a rearranged flavonone - chromene (II) isolated and characterised (*J. Chem. Soc. C* 1968, 2625).

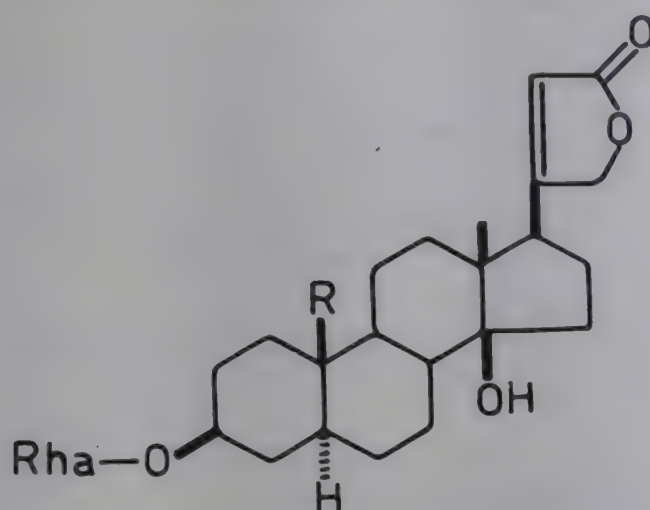
NEW COMPOUNDS



I



II



Corotoxigenin rhamnoside

R = CHO

Coroglaucigenin rhamnoside

R = CH₂OH

BIOLOGICAL ACTIVITY

Rottlerin and acetylrottlerin showed antifertility effect. Isorottlerin was inactive or only slightly active (*Indian J. Med. Res.* 1960, 48, 52).

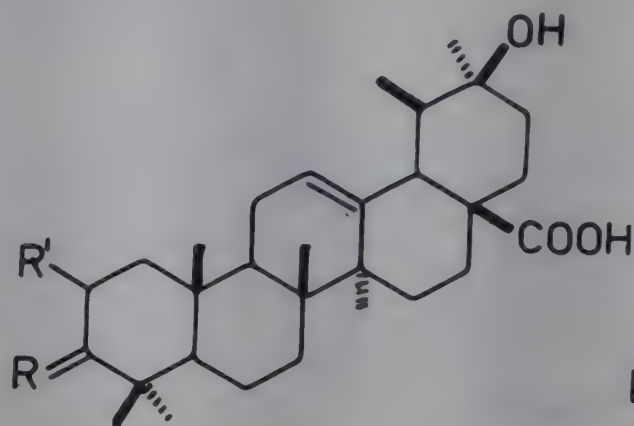
MALUS (Rosaceae)

M. communis DC.; see *M. pumila* Mill.

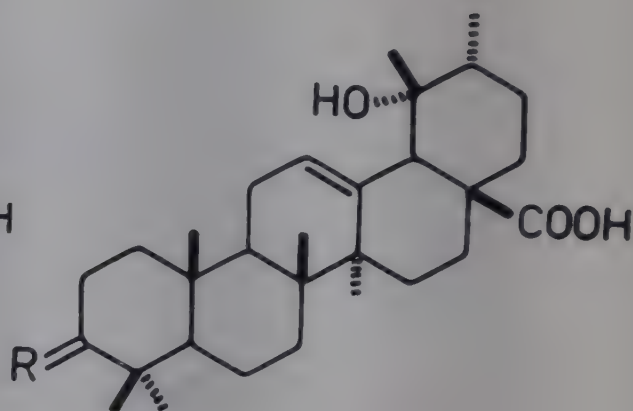
M. pumila Mill. syn. *M. sylvestris* Hort. (non Mill.), *M. communis* DC., *Pyrus malus* L. p.p. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 160).

Structure of eriodictyol glycoside, mp. 168°, shown as eriodictyol-7-glucoside (*Tetrahedron Lett.* 1966, 5133); presence of sorbitol, sucrose and glucose in leaves and buds (*Can. J. Bot.* 1963, 41, 175; *Chem. Abstr.* 1963, 58, 8232 h); 3-rhamnoglucoside, glucoside, diglucoside, galactoside, rhamnoside, arabinoside and xyloside of quercetin, p-coumaric acid, p-coumarylquinic acid, chlorogenic acid and phlorizin from fruit cuticle (*Long Ashton Agric. Hort. Res. Sta., Annu. Rep.* 1965, 255; *Chem. Abstr.* 1967, 66, 35465 v); ursolic acid and 2- β -hydroxyursolic acid from apple skin (*Chem. Ind.* 1966, 1720); ursolic acid (0.2) and β -sitosterol (0.035%) from leaves (*Arch. Pharm.* 1961, 294, 389; *Chem. Abstr.* 1962, 56, 711 c); β -sitosterol, friedelin, epifriedelinol, mp. 275° from bark (*J. Indian Chem. Soc.* 1965, 42, 573); detection of leucocyanidin and leucopelargonidin in leaves by PC (*Acta Soc. Bot. Pol.* 1967, 36, 251; *Chem. Abstr.* 1968, 68, 19506 v); two new triterpenoids - 20 β -hydroxyursolic acid and 2 ξ ,20 β -dihydroxyursonic acid - from apple peel (*J. Chem. Soc. C* 1967, 851); isolation and structure of a glucan containing glucose units linked by (1 \rightarrow 4) and (1 \rightarrow 6) bonds (*Collect. Czech. Chem. Commun.* 1967, 32, 3071); pomolic and pomonic acids from apple peel characterised as 3 β ,19 α -dihydroxy-12-ursen-28-oic acid and 3-oxo-19 α -hydroxy-12-ursen-28-oic acid respectively (*Chem. Ber.* 1967, 100, 1252).

NEW COMPOUNDS

2,20 β -Dihydroxyursonic acid

R = O, R' = OH

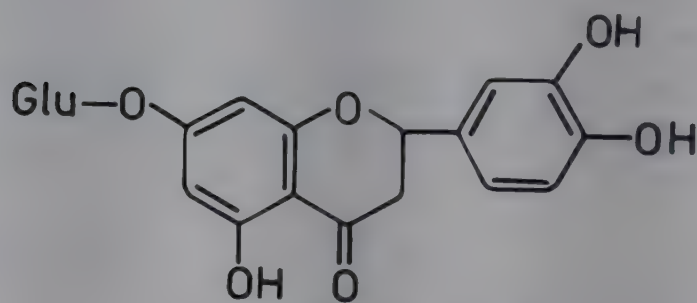
20 β -Hydroxyursolic acidR = H, β -OH, R' = H

Pomolic acid

R = H, β -OH,

Pomonic acid

R = O



Eriodictyol-7-glucoside

M. sylvestris Mill.; see *M. pumila* Mill.**MALVA** (Malvaceae)*M. sylvestris* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 161).Mucins from flowers hydrolysed to give galactose, arabinose, rhamnose and galacturonic acid (*Pharm. Zentralhalle* 1961, 100, 14; *Chem. Abstr.* 1961, 55, 15829 h); choline from leaves (*Pharm. Delt. Epistem. Ekdosis* 1963, 3, 14; *Chem. Abstr.* 1964, 61, 2905 d).**MAMMEA** (Clusiaceae)*M. americana* L.

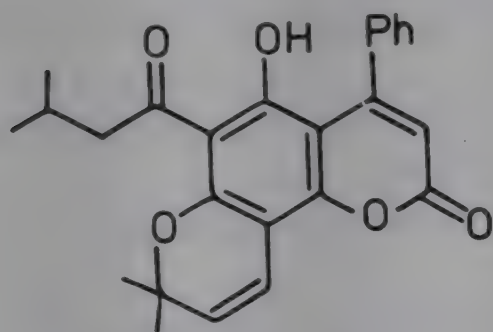
Eng. - Mammey apple.

Mammein characterised as 4-propyl-5,7-dihydroxy-6-isopentyl-8-isovaleryl coumarin (*J. Org. Chem.* 1960, 25, 2164); 4-phenyl-5,7-dihydroxy-6-isovaleryl-8-(3-methyl-2-buten-1-yl)-coumarin (mammeisin), mp. 98°, from fruit peels (*J. Org. Chem.* 1961, 26, 1180); a new coumarin - mammeigin, mp. 144° - from seed oil characterised as 5-hydroxy-6-isovaleryl-8,8-dimethyl-4-phenyl-2H,8H-benzo(1,2-b:3,4-b')dipyrans-2-one and a diterpene alcohol - mammeol - isolated (*J. Org. Chem.* 1965, 30, 2342; *Chem. Ind.* 1964, 1065); mammeisin from fruit pulp (*Ceylon Assoc. Advan. Sci., Proc. Annu. Sess.* 1966, 22, 193; *Chem. Abstr.* 1969, 70,

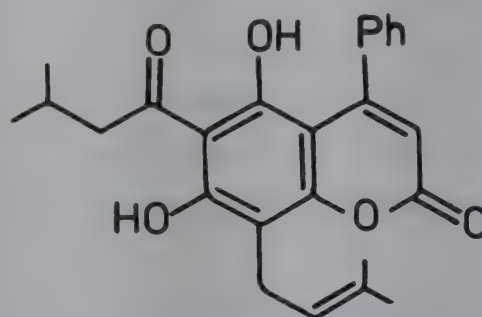
57576 a); isolation and structure elucidation of three 4-phenylcoumarins - mammea A/BA, A/AB and A/BB - and isolation of 2-methoxyxanthone and friedelin from seeds; mammea A/AA and A/A cyclo D identical with mammeisin and mammeigin respectively (*Tetrahedron Lett.* 1966, 145; *J. Chem. Soc. C* 1967, 2553); isolation of three 4-propyl and a 4-pentyl coumarins - mammea B/BA, B/BB, B/BC and C/BB - from seeds and their structure elucidation; previously reported mammein corresponds to mammea B/BA (*Tetrahedron Lett.* 1966, 151; *J. Chem. Soc. C* 1967, 2545).

Distribution : Native of West Indies, cultivated in India.

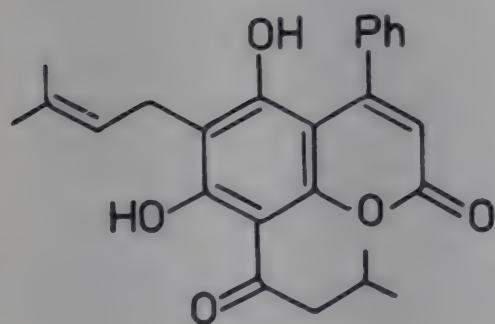
NEW COMPOUNDS



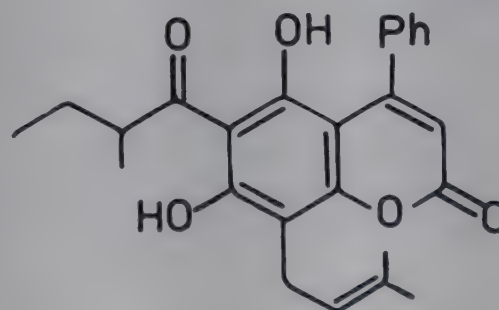
Mammeigin



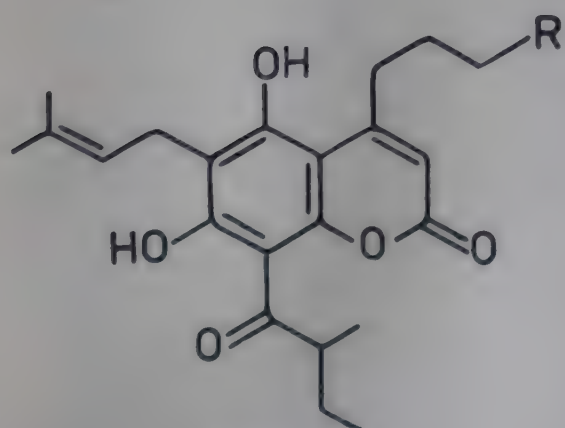
Mammeisin



A/BA



A/AB

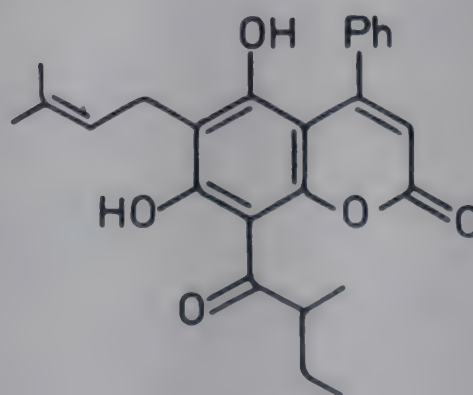


B/BB

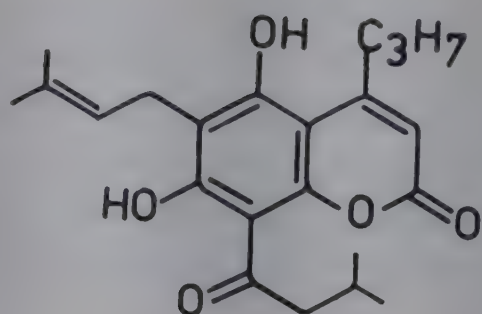
R = H

C/BB

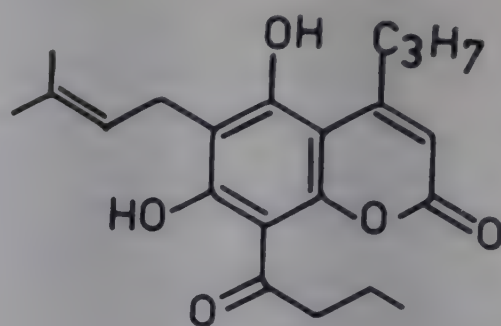
R = Et



A/BB



B/BA



B/BC

M. longifolia Planch. ex Triana; see *M. suriga* (Ham. ex Roxb.) Kosterm.

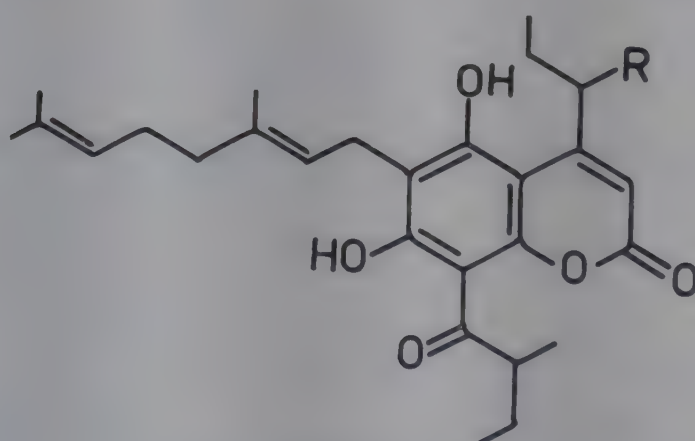
M. suriga (Ham. ex. Roxb.) Kosterm. syn. *M. longifolia* Planch. ex Triana; *Ochrocarpus longifolius* Benth. & Hook.f.

H. - Nagkesar; S. - Nagkesara; B. - Nagesar; Mar. - Pun nag; Guj. - Ratinagkesar; Tel. - Suraponna; Tam. - Nagaptee; Kan. - Wundi; Mal. - Seraya.

Two new 4-alkylated coumarins - surangin A and B - from roots (*Tetrahedron* 1969, 25, 1453).

Distribution : Evergreen forests of Western Ghats from Khandala southwards to Malabar and Coimbatore, ascending to 600 m.

NEW COMPOUNDS



Surangin A

R = H

Surangin B

R = OAc

MANDRAGORA (Solanaceae)

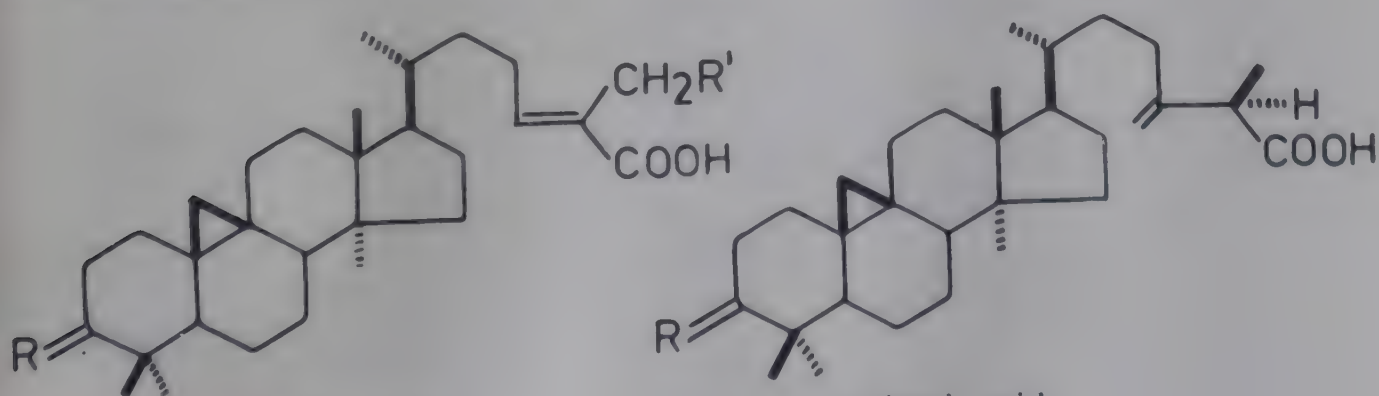
M. officinarum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 161).

Detection of hyoscyamine, scopolamine, atropine, cuskygrine and scopine in roots by PC (*Helv. Chim. Acta* 1962, 45, 2297).

MANGIFERA (Anacardiaceae)

M. indica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 161).

Detection of two flavonoids, two phenolic compounds, glucose, galactose, arabinose, xylose, rhamnose and tannins in leaves by PC (*Planta Med.* 1964, 12, 421); friedelin, β -sitosterol, mangiferin (6.9%), mp. 278° , protocatechuic acid, catechin, gallic, ellagic, m-digallic acids, m-trigallic acid, gallotanin, butin, fisetin, leucocyanidin and quercetin isolated from different parts of plant (*Indian J. Chem.* 1964, 2, 378; *Planta Med.* 1965, 13, 346; *ibid.* 1966, 14, 171; *Leather Sci.* 1967, 14, 247; *Chem. Abstr.* 1968, 68, 896 a; *Tetrahedron* 1967, 23, 1363, *Leather Sci.* 1969, 16, 13; *Chem. Abstr.* 1969, 71, 10286 c); isolation and characterisation of new triterpenic acid - mangiferolic acid, mp. 181° ; isomangiferolic acid, hydroxymangiferolic acid, mangiferonic acid, hydroxymangiferonic acid, mp. 190° , ambonic acid and ambolic acid isolated (*Tetrahedron Lett.* 1965, 2377; *Ric. Sci. Rend. Sez. A* 1965, 8, 484; *Chem. Abstr.* 1965, 63, 18181 d; *Ric. Sci.* 1966, 36, 494; *Chem. Abstr.* 1967, 66, 11062 y; *Ann. Chim.* 1967, 57, 522; *Chem. Abstr.* 1968, 68, 13210 x; *Ann. Chim.* 1967, 57, 508; *Chem. Abstr.* 1968, 68, 13209 d); polysaccharides from unripe fruits identified as glucan, a highly branched arabinan and (1 \rightarrow 4)linked galactouronan (*Bull. Chem. Soc. Jpn.* 1965, 38, 1077); new triterpenes - oleanolic aldehyde, mp. 168° , an aldehyde (I), mp. 166° , a diol (II), mp. 154° , a dimer and (20S)dammar-24-ene- 3β ,20 diol, mp. 130° - along with erythrodiol from resin (*Ric. Sci.* 1967, 37, 370; *Chem. Abstr.* 1967, 67, 116988 r; *Ric. Sci.* 1968, 38, 537; *Chem. Abstr.* 1969, 70, 78191 c); acetates of cycloartanol, amyirin and lupeol isolated (*Ann. Chim.* 1967, 57, 522; *Chem. Abstr.* 1968, 68, 13210 x); homomangiferin isolated and characterised as mangiferin 3-methyl ether (*Chem. Pharm. Bull.* 1968, 16, 760).

NEW COMPOUNDS

Mangiferolic acid

R = H, β -OH, R' = H

Mangiferonic acid

R = O, R' = H

Isomangiferolic acid

R = H, α -OH, R' H

Hydroxymangiferonic acid

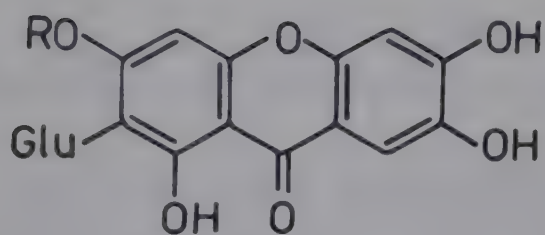
R = O, R' = OH

Ambonic acid

R = O

Ambolic acid

R = H, β -OH

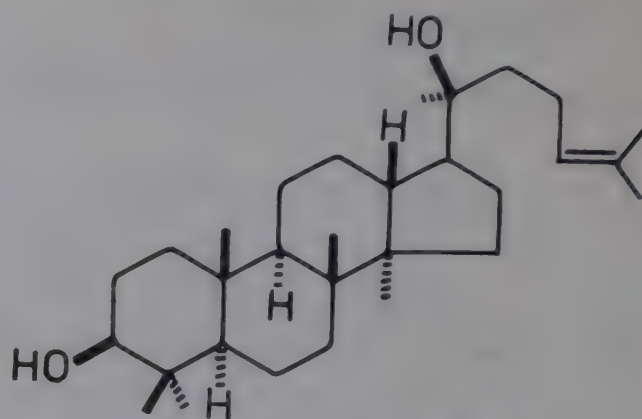


Mangiferin

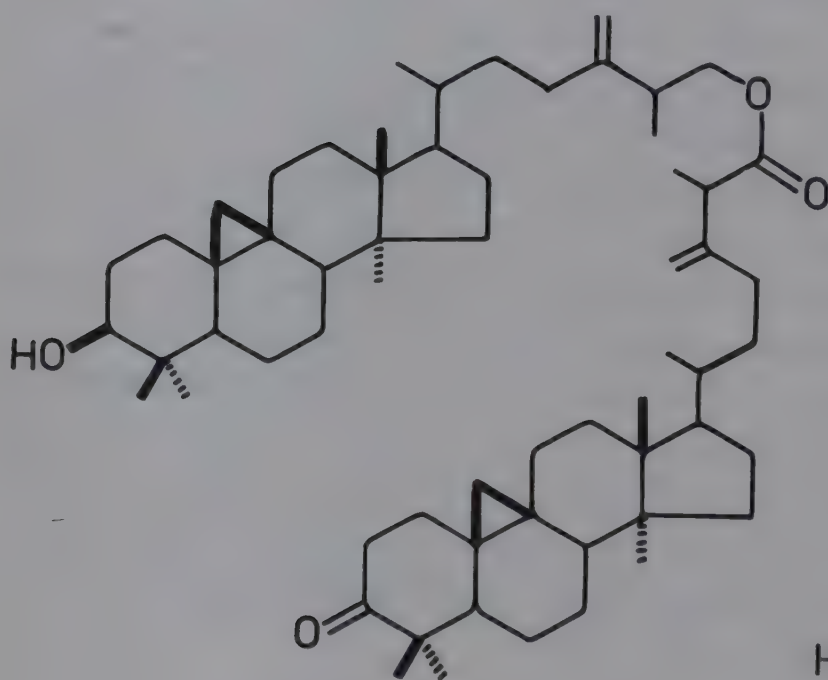
R = H

Homomangiferin

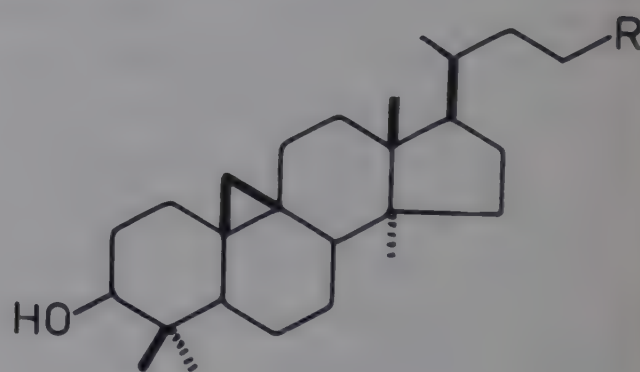
R = Me



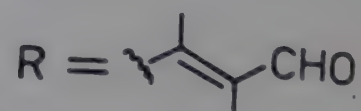
(20S)Dammar-24-ene-3b,20-diol



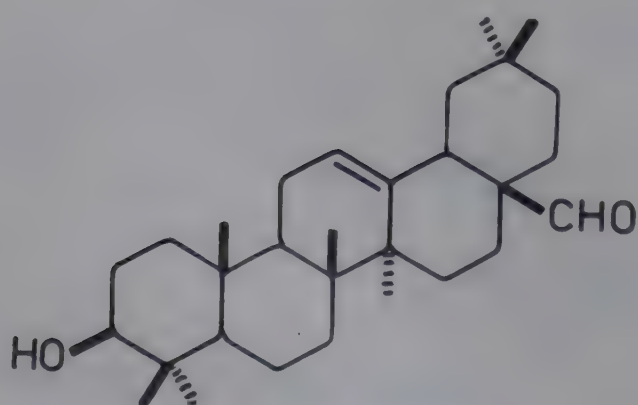
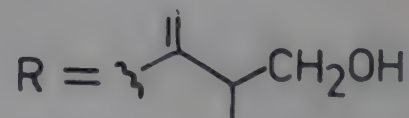
Mangifera dimer



I



II



Oleanolic aldehyde

BIOLOGICAL ACTIVITY

Mangiferin has cardiotonic and diuretic properties (Brit. 1,099,764 (1968) Jan. 17; *Chem. Abstr.* 1968, 69, 38737 h).

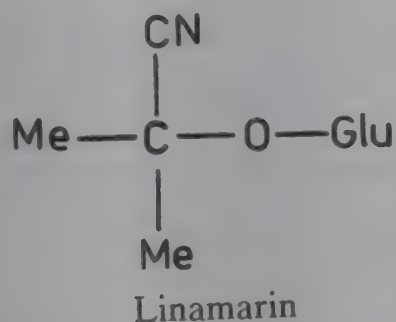
MANIHOT (Euphorbiaceae)

M. esculenta Crantz syn. *M. utilisissima* Pohl (*Glossary Indian Med. Plants*, Chopra, Nayar

& Chopra, PID, New Delhi, 1956, p. 161).

Determination of α - and β -carotenes and hydroxycarotenes by colorimetric analysis (*Inst. Nacl. Pesquisas Amazonia, Publ. Quim.* 1964, 35; *Chem. Abstr.* 1965, 62, 8117 d); linamarin, mp. 143°, isolated from tubers, characterised as 2-(β -D-glucopyranosyloxy)isobutyronitrile (*Phytochemistry* 1966, 5, 1323).

NEW COMPOUNDS



M. utilisissima Pohl; see *M. esculenta* Crantz

MANILKARA (Sapotaceae)

M. hexandra (Roxb.) Dubard syn. *Mimusops hexandra* Roxb. (*Glossary Indian Med. Plants*, Chopra; Nayar & Chopra, PID, New Delhi, 1956, p. 168).

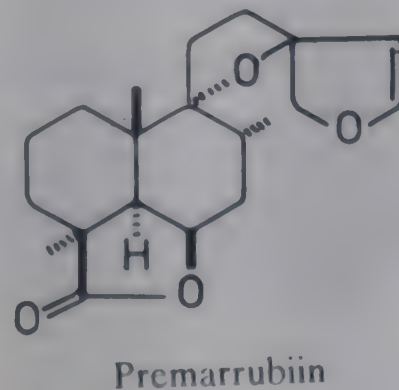
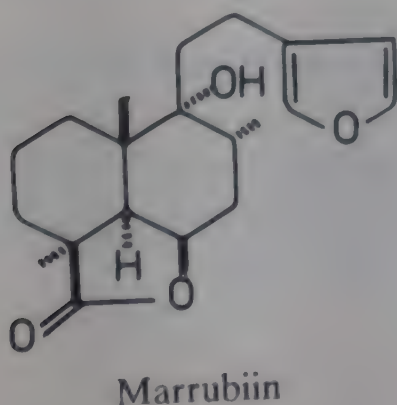
α -Spinasterol, α - and β -amyirin acetates, α - and β -amyirin cinnamates, taraxerol, taraxeryl acetate, ursolic acid and two unidentified triterpenoids, mp. 263° and 215°, β -sitosterol glucoside, quercitol, quercetin and dihydroquercetin from bark, fruits, seeds and roots; cinnamic acid and hentriacontane from roots (*Phytochemistry* 1965, 4, 345; *ibid.* 1966, 5, 535; *ibid.* 1968, 7, 2173).

MARRUBIUM (Lamiaceae)

M. vulgare L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 162).

Structure and stereochemistry of marrubiin (*Chem. Ind.* 1961, 1832; 2nd *Int. Symp. Chem. Natural Products* 1962, 99; *Tetrahedron* 1967, 23, 3909); betonicine (0.3), choline (0.2) and unidentified alkaloid (0.001%) isolated (*Chem. Ind.* 1963, 1693); a new diterpenoid - premarrubiin - isolated and characterised (*J. Chem. Soc. C* 1969, 2014).

NEW COMPOUNDS

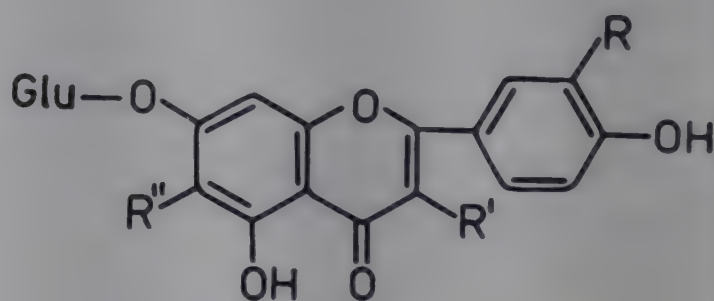
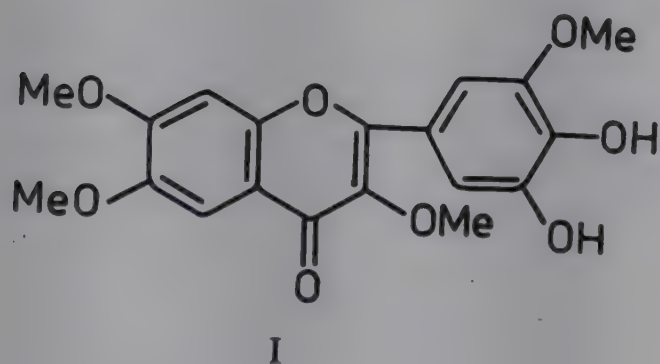


MATRICARIA (Compositae)

M. chamomilla L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 162).

Chamomile oil at low dose showed spasmolytic effect 50-fold that of papaverine and higher antiinflammatory effect than guaiazulene (*Deut. Apotheker-Ztg.* 1966, 106, 693; *Chem. Abstr.* 1967, 67, 72247 y).

New flavone glucoside - luteolin-7-glucoside, mp. 256° - patulitrin, mp. 261°, quercimeritrin, mp. 246°, apigenin-7-glucoside and polyhydroxyflavone glucoside of gossypetrin type isolated (*Arzneim. Forsch.* 1963, 13, 33); mucilage from ovary of flowers yielded xylose (21.0), arabinose (10.0), galactose (15.0), glucose (7.0), rhamnose (2.0), and glucuronic acid (45.0%) (*Planta Med.* 1964, 12, 528); a lipophilic flavone characterised as 4',5'-dihydroxy-3,3',6,7-tetramethoxyflavone (I) (*Naturwiss.* 1966, 53, 19; *Chem. Abstr.* 1966, 64, 12634 e); bisabolol oxide A isolated from oil (*Indian J. Chem.* 1969, 7, 100); oil contained an ene-yne-dicycloether [2-(butyn-2-ylidene)-3-en-dihydrofuran-(5-spiro-2')-tetrahydrofuran] (*Deut. Apotheker-Ztg.* 1966, 106, 698; *Chem. Abstr.* 1967, 67, 72274 y).

NEW COMPOUNDS

Luteolin-7-glucoside

R = OH, R', R'' = H

Patulitrin

R, R' = OH, R'' = OMe

Quercimeritrin

R, R' = OH, R'' = H

Apigenin-7-glucoside

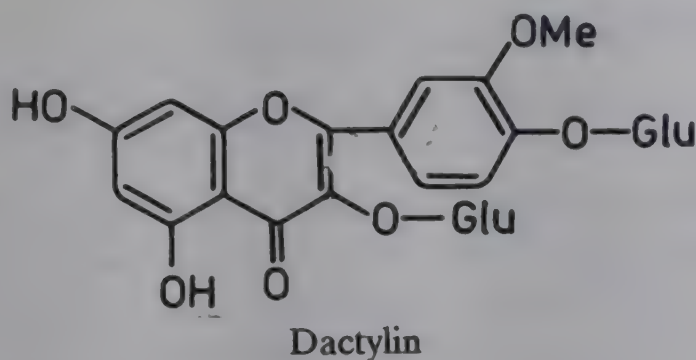
R, R', R'' = H

MATTHIOLA (Brassicaceae)

M. incana (L.) R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 163).

Dactylin (0.4%) from seeds characterised as 5,7-dihydroxy-3'-methoxy-flavone-3,4'-diglucoside (*Z. Naturforsch.* 1962, 17, 9; *Chem. Abstr.* 1962, 57, 2179 c); 3-arabinosylrhamnosido-7-rhamnoside of kaempferol from petals (*Chem. Ind.* 1962, 222).

NEW COMPOUNDS



MEDICAGO (Papilionaceae)

M. lupulina L.

Eng. - Black medick, Hop clover, Yellow trefoil.

Partial hydrolytic products from seed galactomannan identified as 4-O- β -D-mannopyranosyl-D-mannose, 6-O- α -D-galactopyranosyl-D-mannose, α -D-galactopyranosyl(1 \rightarrow 6)-O- β -D-mannopyranosyl(1 \rightarrow 4)-D-mannose, β -D-mannopyranosyl(1 \rightarrow 4)-O-[α -D-galactopyranosyl(1 \rightarrow 6)-D-mannose and tetrasaccharides (*Acta Chem. Scand.* 1968, 22, 870).

Distribution : Punjab, Kumaon, upper Gangetic plain, Bihar and north Bengal, ascending to 3600 m. in the Himalayas.

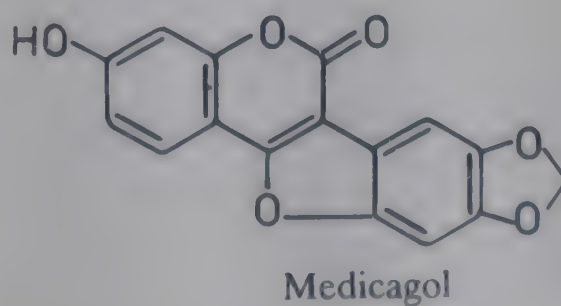
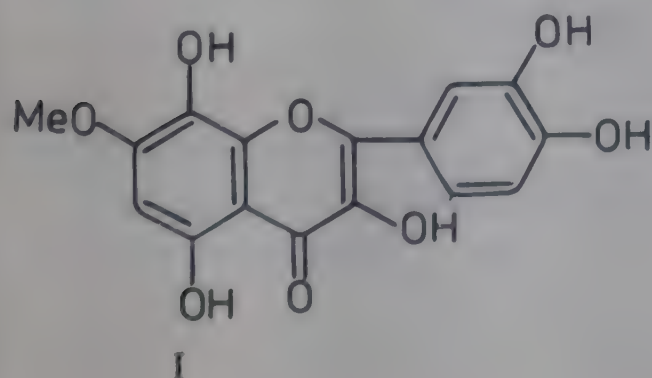
M. sativa L.

Eng. - Lucerne, Alfalfa; H. - Vilayti gawuth, Lasunghas; Mar. - Vilayti gavat; Guj. - Vilayti ghas; Kan. - Vilayati hullu; Ladakh - Hol; P. - Lusan.

Sialic acid from seeds (*Arch. Biochem. Biophys.* 1964, 108, 356; *Chem. Abstr.* 1965; 62, 1965 c); 7-methoxy-3,5,8,3',4'-pentahydroxyflavone (I), mp. 261°, from seeds (*Can. J. Plant. Sci.* 1968, 97; *Chem. Abstr.* 1968, 69, 10328 b); medicagenic acid and a saponin obtained from flowers; structure of saponin proposed as 2 β -hydroxy-3 β -(β -L-rhamnosyl- β -D-glucosyl- β -D-glucosyloxy)-olean-12-ene-23,28-dioic acid (*J. Org. Chem.* 1965, 30, 166); a new coumestan - medicagol - characterised (*J. Org. Chem.* 1965, 30, 2353); 3',4',7-trihydroxyflavone isolated (*J. Pharm. Sci.* 1965, 54, 1555).

Distribution : Cultivated in India.

NEW COMPOUNDS

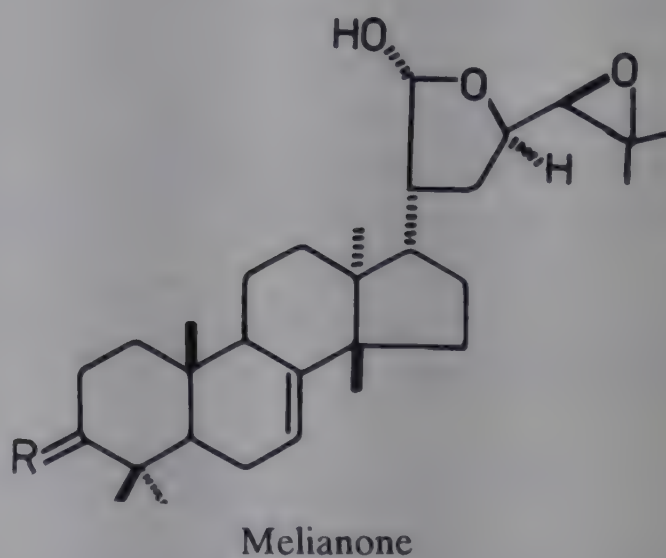
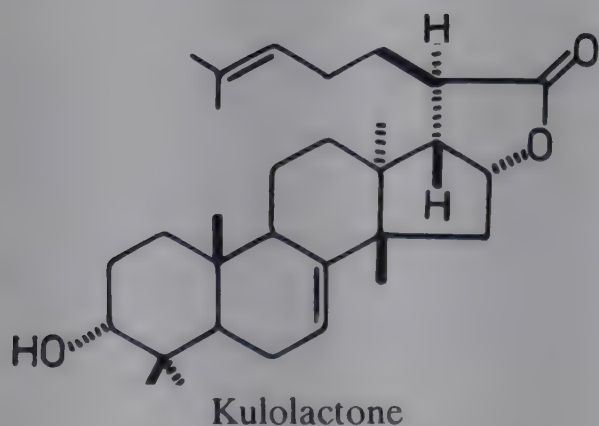
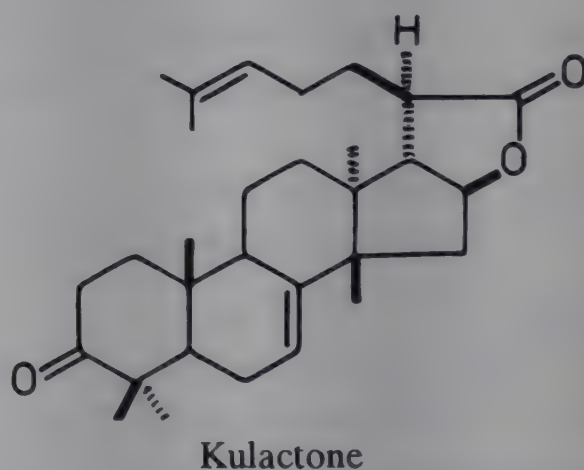
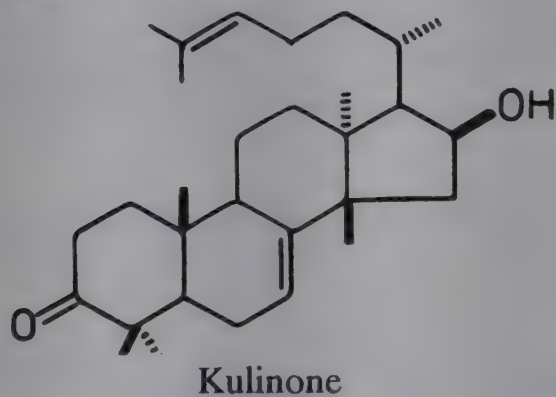


MELIA (Meliaceae)

M. azadirachta L.; see *Azadirachta indica* (L.) A. Juss.

M. azedarach L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 163).

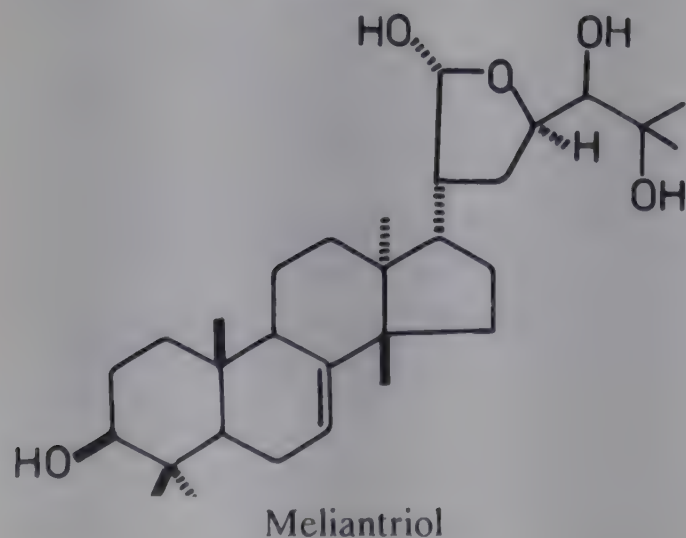
Kaempferol-3-L-rhamno-D-glucoside, mp. 181° and rutin isolated from leaves (*Yakugaku Zasshi* 1964, 84, 894; *Chem. Abstr.* 1965, 62, 821 e); isolation and structure of melianone, mp. 223° , and melianol, mp. 194° , from fruits (*Tetrahedron Lett.* 1966, 2049; *J. Chem. Soc. C* 1967, 1347); meliantriol, mp. 176° , isolated (*Chem. Commun.* 1967, 910); isolation of kuline from bark (*Chem. Commun.* 1968, 1156); tetracyclic triterpenoids - kulactone, mp. 163° , kulolactone and kulinone - isolated from tree bark and their structures elucidated (*Tetrahedron Lett.* 1969, 891; *Tetrahedron* 1973, 29, 1911); crystal structure of kulactone (*Chem. Commun.* 1971, 424).

NEW COMPOUNDS

R = O

Melianol

R = H, β -OH

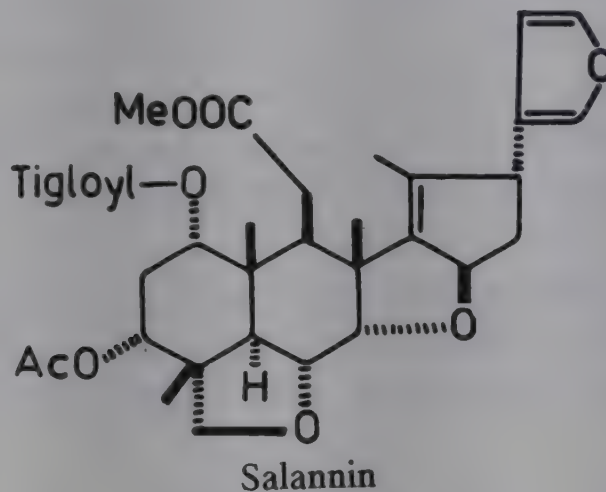


M. composita Willd.; see *M. dubia* Cav.

M. dubia Cav. syn. *M. composita* Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 164).

Salannin from fruits (*Phytochemistry* 1969, 8, 1817).

NEW COMPOUNDS

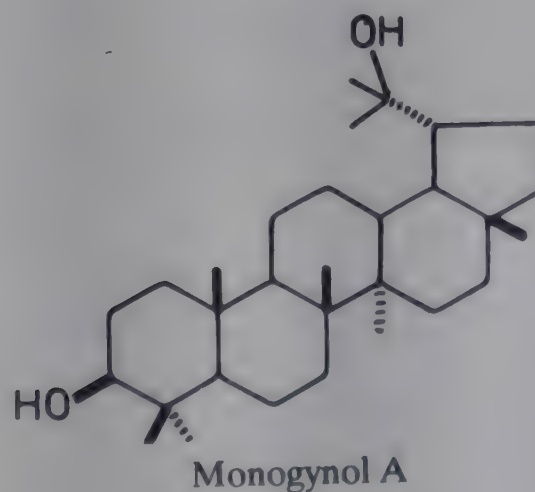


MELODINUS (Apocynaceae)

M. monogynus Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 164).

Monogynol A, mp. 232° and monogynol B characterised as 3,20-lupanediol and lupeol respectively (*J. Sci. Ind. Res.* 1959, 18B, 262); digitoxigenin and seven other cardenolides from roots (*Curr. Sci.* 1966, 35, 489); butenolides - jaintigenin, pisigenin, medigenin, digitoxigenin, harinin, jaintin, gynin, medinin and pisidin - from roots (*Chem. Ber.* 1968, 101, 2084).

NEW COMPOUNDS



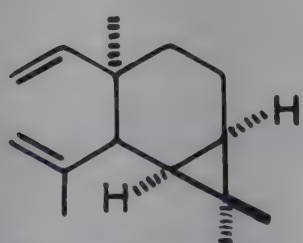
BIOLOGICAL ACTIVITY

Medigenin and gynin exhibited cardioactive effect *in vitro* on frog and rabbit heart (*Chem. Ber.* 1968, 101, 2084).

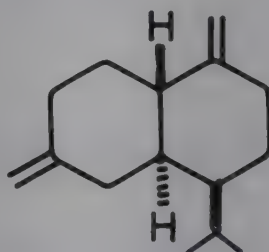
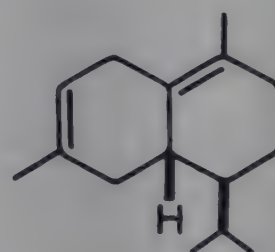
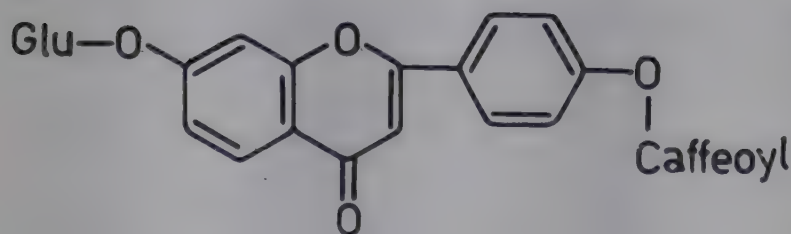
MENTHA (Lamiaceae)

M. piperita L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 165).

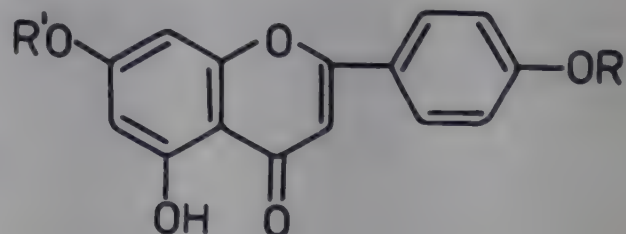
Flavonoid glycosides - menthoside, mp. 271° and isorhoifolin, mp. 269° - from leaves (*Farm. Zh.* 1966, 21, 58; *Chem. Abstr.* 1966, 65, 13810 e); 18 sesquiterpene hydrocarbons, 5 of these not described earlier, were isolated from essential oil; known hydrocarbons, (+) β -elemene, (-)caryophyllene, (-) α -muurolene, (+) γ -muurolene, (+) ϵ -muurolene, (+) γ -cadinene, (+) δ -cadinene, (-)calamene, (+)aromadendrene, (+)ylangene, (-)cubebene, (+) α -bourbonene and (-) β -bourbonene were identified; structures of new hydrocarbons - (-)bicycloelemene, (-) ϵ -bulgarene and (+) α -maaliene - assigned and structure of (+) δ -cadinene revised (*Collect. Czech. Chem. Commun.* 1967, 32, 808; *ibid.* 1967, 32, 822); absolute configuration of (-)bicycloelemene (*Chem. Commun.* 1971, 308); a new flavonoid characterised as 4'-trans-O-caffeoyl-5,7,4'-trihydroxyflavone-7- β -D-glucopyranoside (I) from flowers (*Farm. Zh.* 1967, 22, 80; *Chem. Abstr.* 1968, 68, 49985 t).

NEW COMPOUNDS

(-)Bicycloelemene

(-) ϵ -Bulgarene(+) δ -Cadinene

I

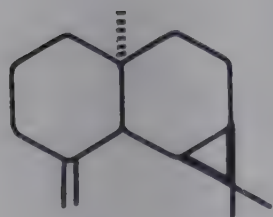


Menthoside

R = Caffeoyl, R' = Glu(5 \rightarrow 1)Rha

Isorhoifolin

R = H, R' = Glu(5 \rightarrow 1)Rha

(+) α -Maaliene

M. pulegium L.

Eng. - Pennyroyal, Pudding grass.

Oil contained pulegone (90.0%) (*An. Real. Soc. Espan. Fis. Quim.* 1967, 57, 791; *Chem. Abstr.* 1962, 57, 8621 e); presence of pulegone, isopulegone, pulegol, menthone, isomenthone, piperityl acetate, piperitenol, cadinene and an unidentified alcohol in essential oil by

chromatography (*Indian Oil Soap J.* 1964, 30, 41; *Chem. Abstr.* 1965, 62, 8928 g).

Distribution : Introduced into India.

M. rotundifolia (L.) Huds.

Eng. - Apple mint, Round leaved mint.

Isopiperitenone and carvone are major constituents of essential oil (*J. Pharm. Sci.* 1964, 53, 1407; *An. Soc. Cient. Argent.* 1966, 181, 49; *Chem. Abstr.* 1967, 66, 58801 r).

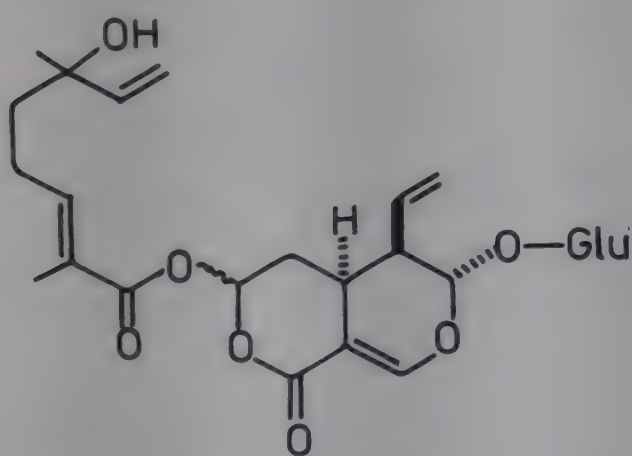
Distribution : Cultivated to small extent in India.

MENYANTHES (Gentianaceae)

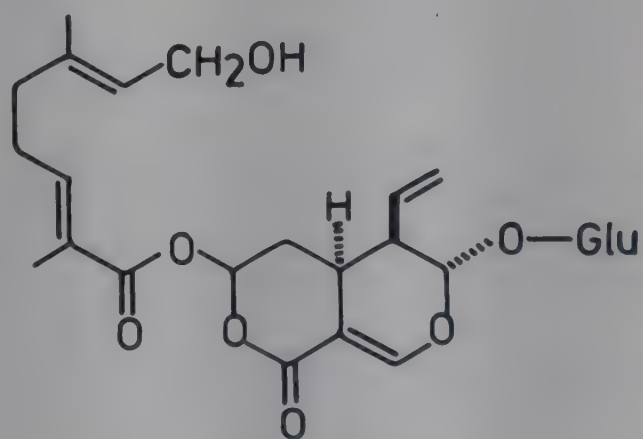
M. trifoliata L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 166).

New glucosides - menthiafolin, mp. 186°, dihydrofoliamenthin and foliamenthin, mp. 194° - isolated and characterised (*Chem. Commun.* 1968, 1277).

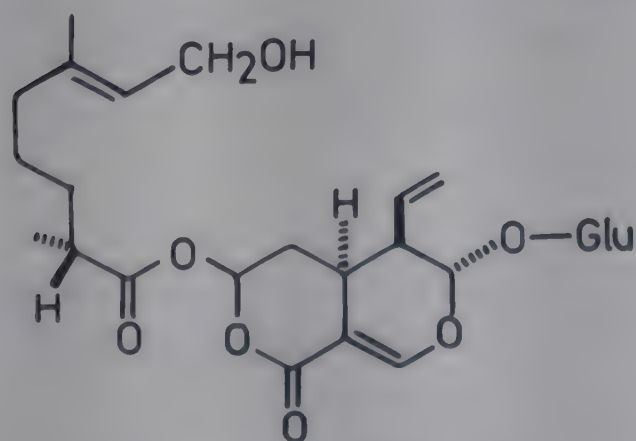
NEW COMPOUNDS



Menthiafolin



Foliamenthin



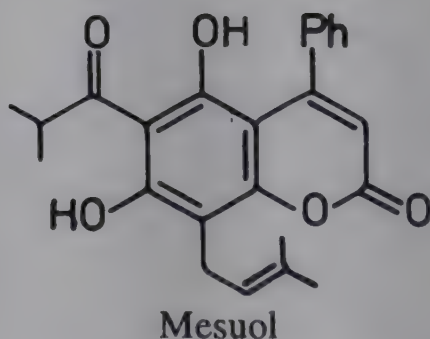
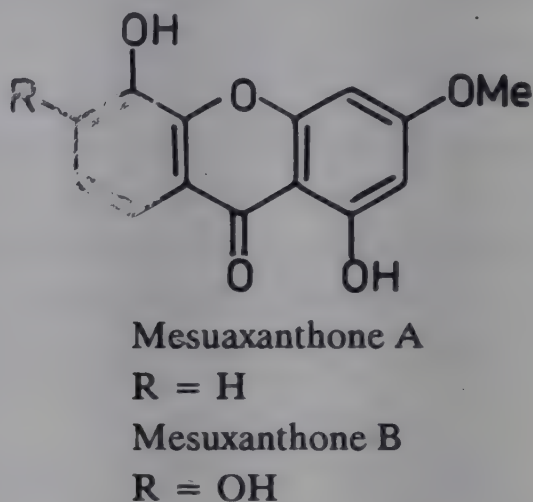
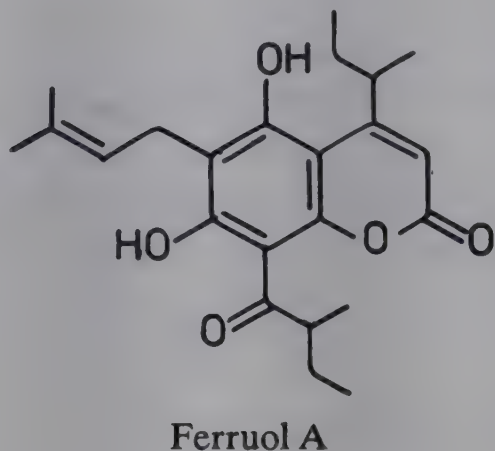
Dihydrofoliamenthin

MESUA (Clusiaceae)

M. ferrea L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 166).

Chemical studies on mesuol; revised structure proposed (*Ceylon Ass. Advan. Sci., Proc. Annu. Sess.* 1966, 22, 193; *Chem. Abstr.* 1969, 70, 57576 s; *Tetrahedron Lett.* 1966, 5727); two new pigments - mesuaxanthone A and mesuaxanthone B - and euxanthone isolated from heartwood; first two compounds characterised as 1,5-dihydroxy-3-methoxyxanthone and 1,5,6-trihydroxyxanthone respectively (*Tetrahedron* 1967, 23, 243); a new 4-alkylcoumarin - ferruol A - from trunk bark (*Tetrahedron* 1967, 23, 4161).

NEW COMPOUNDS



BIOLOGICAL ACTIVITY

Mesuol and mesuone showed antibiotic activity; mesuol was more active than mesuone against *Mycobacterium phlei* (*Proc. Nat. Inst. Sci. India* 1959, 25B, 8; *Chem. Abstr.* 1960, 54, 1649 c).

METASEQUOIA (Taxodiaceae)

M. glyptostrobooides Hu & Cheng

Quercetin (0.03) and sequoyitol (0.07%) from leaves (*Yakugaku Zasshi* 1960, 80, 1557; *Chem. Abstr.* 1961, 55, 10424 f); (+)-n-10-nonacosanol, mp. 81° and β -sitosterol isolated (*Z. Naturforsch.* 1968, 23, 479; *Chem. Abstr.* 1968, 69, 59501 s); stigmasterol, campesterol, stigmast-4-en-3-one, stigmasta-4,22-dien-3-one, campest-4-en-3-one and 5-stigmasten-3,6-dione, α -cadinol, m-cresol and fatty acids identified as Me esters, from twigs (*Chem. Pharm. Bull.* 1969, 17, 163).

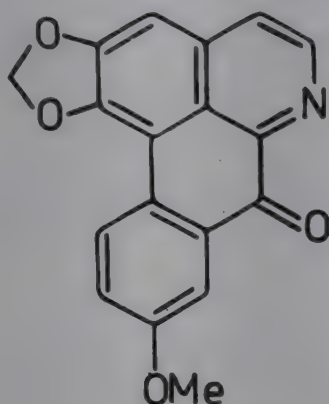
Distribution : Grown in Calcutta gardens.

MICHELIA (Magnoliaceae)*M. lanuginosa* Wall.

Nep. - Gogoi-champ, Lapcha-phusre, Guay-champ; Khasi - Dieng- lali.

Lanuginosine, mp. 302°, from trunk bark (*Chem. Ind.* 1969, 1056).

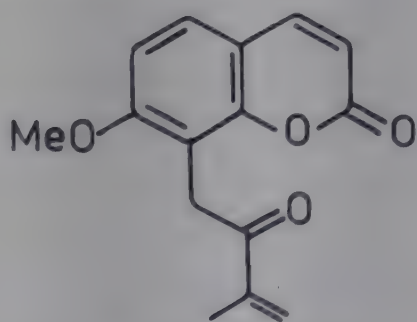
Distribution : Himalayas from Nepal to Bhutan and Khasi Hills, alt. 1500-2100 m.

NEW COMPOUDNS

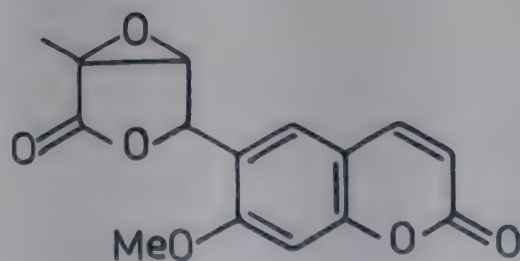
Lanuginosine

MICROMELUM (Rutaceae)*M. integerrimum* (Buch.-Ham. ex Colebr.) W. & A. ex M. Roem. syn. *M. pubescens* auct. (non Blume)Two new coumarins - micropubescin, mp. 130°, and micromelumin, mp. 218° - from bark (*Sci. Cult.* 1967, 33, 371).

Distribution : Tropical Himalayas from Nepal to Bhutan, Khasi Hills and Andaman Islands.

NEW COMPOUNDS

Micropubescin

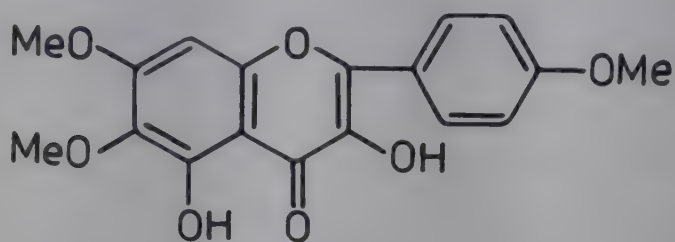


Micromelumin

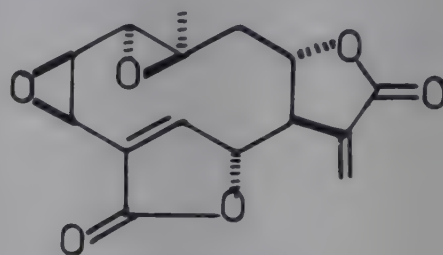
M. pubescens Blume; see *M. integerrimum* (Buch.-Ham. ex Colebr.) W. & A. ex M. Roem.**MIKANIA** (Asteraceae)*M. cordata* (Burm.f.) R.L. Robinson syn. *M. scandens* Hook.f. (non Willd.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 167).Epifriedelinol, fumaric acid and a new flavone - mikanin - from roots, leaves and stems; mikanin characterised as 3,5-dihydroxy-6,7,4'-trimethoxyflavone (*J. Chem. Soc.* 1965, 6371; *Phytochemistry* 1968, 7, 1035); synthesis of mikanin (*Chem. Ber.* 1967, 100, 1768); isolation and

structure of a sesquiterpene dilactone - mikanolide, mp. 230° - from leaves and stems (*Tetrahedron Lett.* 1967, 3111); stigmasterol, friedelin, glucose and fructose from roots (*Phytochemistry* 1968, 7, 1035).

NEW COMPOUNDS



Mikanin



Mikanolide

M. scandens Willd.; see *M. cordata* (Burm.f.) R.L. Robinson

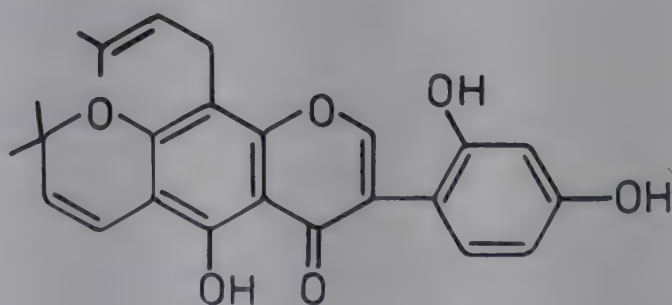
MILLETTIA (Papilionaceae)

M. auriculata Baker ex Brand.; see *M. extensa* (Benth.) Baker

M. extensa (Benth.) Baker syn. *M. auriculata* Baker ex Brand (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 167).

Auriculatin characterised as 3-(2,4-dihydroxyphenyl)-5-hydroxy-10-(3-methyl-but-2-enyl)-8,8-dimethyl-4H,8H-pyrano[3,2-g]-chromen-4-one (*J. Chem. Soc. C* 1968, 1899).

NEW COMPOUNDS



Auriculatin

MIMUSOPS (Sapotaceae)

M. elengi L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 167).

Quercitol, ursolic acid, glucose, a triterpene alcohol, mp. 236° , quercetin, dihydroquercetin and β -sitosterol glucoside from fruits and seeds; taraxerone, taraxerol, betulinic acid, α -spinasterol from bark; hentriacontane, β -carotene and lupeol from leaves, heartwood and roots (*Phytochemistry* 1967, 6, 453; *ibid.* 1967, 6, 1309; *ibid.* 1968, 7, 501).

M. hexandra Roxb.; see *Manilkara hexandra* (Roxb.) Dubard

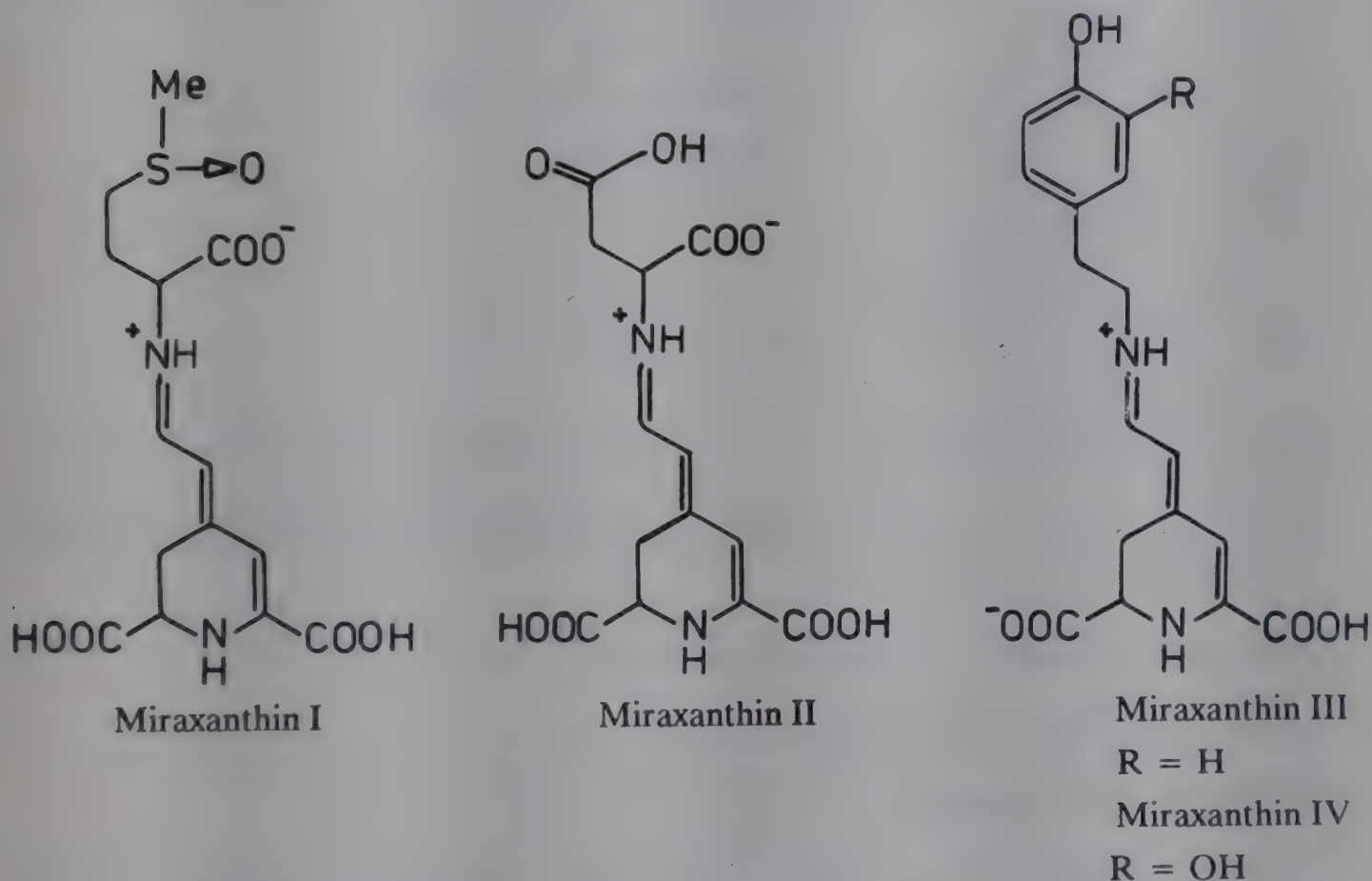
MIRABILIS (Nyctaginaceae)

M. jalapa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956,

p. 168).

Four new miraxanthins I, II, III and IV isolated from flowers and characterised; indicaxanthin and vulgaxanthin I also isolated (*Phytochemistry* 1965, 4, 817).

NEW COMPOUNDS

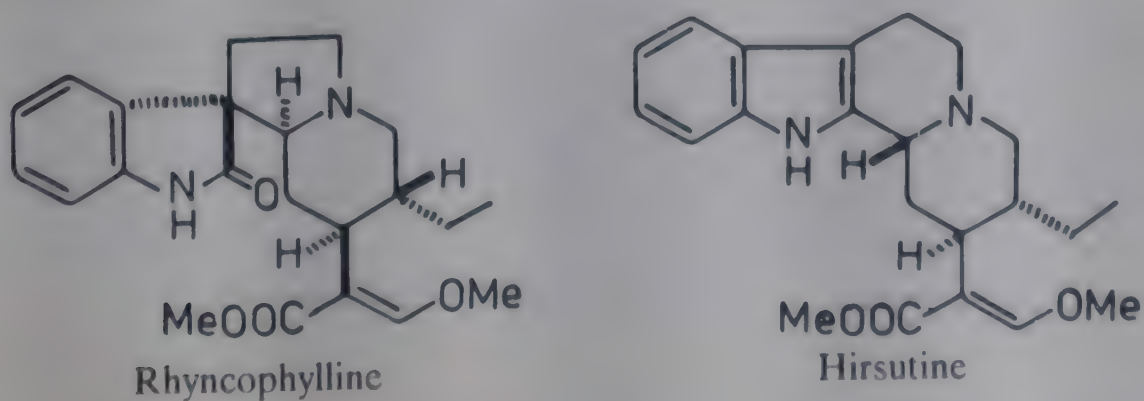


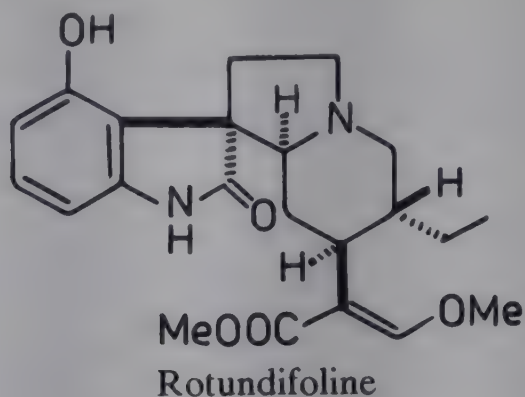
MITRAGYNA (MYTRAGYNA) (Rubiaceae)

M. parvifolia (Roxb.) Korth. syn. *Stephegyne parvifolia* Korth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 173).

Four alkaloids - rotundifoline, isorotundifoline, rhynchophylline and isorhynchophylline - from leaves (*Planta Med.* 1964, 12, 160; configurations of rhynchophylline (*J. Am. Chem. Soc.* 1962, 84, 3871) and rotundifoline (*Tetrahedron* 1968, 24, 523); other alkaloids - pteropodine, isopteropodine, hirsutine, dihydrocorynantheine, akuammigine and demethoxyisohortiamine, mp. 248° - isolated from leaves (*Planta Med.* 1969, 17, 51).

NEW COMPOUNDS





MOLLUGO (Molluginaceae)

M. hirta Thunb.; see *Glinus lotoides* L.

M. lotoides (L.) Kuntze; see *Glinus lotoides* L.

M. nudicaulis Lamk. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 168).

Mollugoflavonolose, mp. 225° and eight saponins isolated (*Ann. Pharm. Fr.* 1962, 20, 257; *Chem. Abstr.* 1962, 57, 7383 d).

M. oppositifolia L.; see *Glinus oppositifolia* (L.) A. DC.

M. spergula L.; see *Glinus oppositifolia* (L.) A. DC.

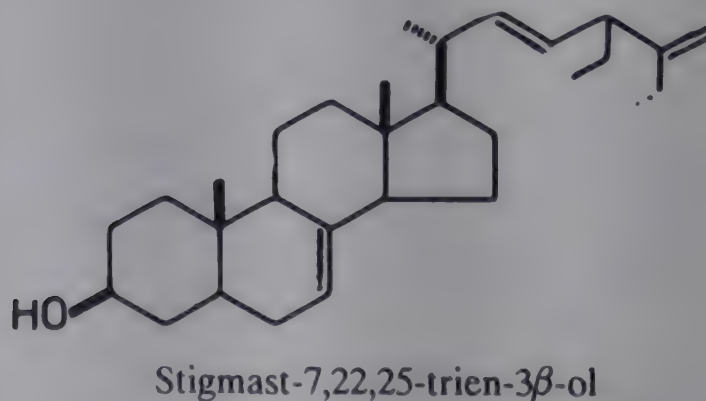
MOMORDICA (Cucurbitaceae)

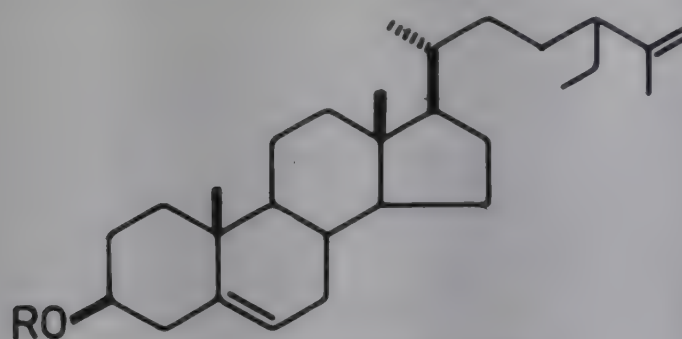
M. charantia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 168).

Fruit juice, orally administered, showed hypoglycaemic activity in normal and diabetic rabbits (*Indian J. Med. Res.* 1960, 48, 471).

A hypoglycaemic substance - charantin, mp. 266° - β -sitosterol- glucoside and a new stigmast-5,25-diene-3 β -O-glucoside from fruits (*Tetrahedron Lett.* 1965, 2217; *Chem. Ber.* 1966, 99, 2765); two new sterols - stigmast-7,25-dien-3 β -ol and stigmast-7,22,25-trien-3 β -ol - isolated and their structures elucidated (*Chem. Ber.* 1966, 99, 3559).

NEW COMPOUNDS



Stigmast-5,25-dien-3 β -ol

R = H

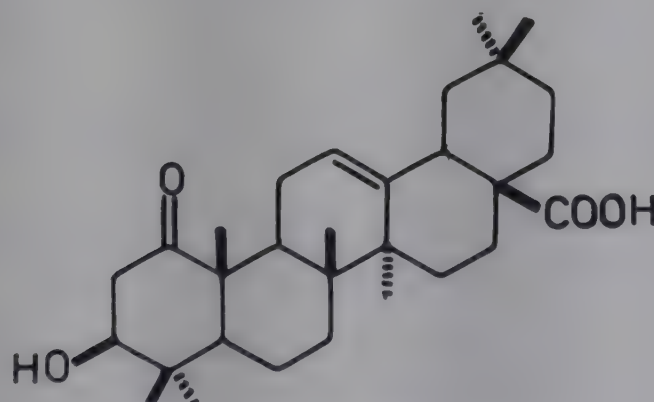
Stigmast-5,25-dien-3 β -O-glucoside

R = Glu

M. cochinchinensis (Lour.) Spreng. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 169).

Oleanolic acid and a sterol isolated; a saponin fraction hydrolysed to give a new triterpene - momordic acid (*Tetrahedron Lett.* 1966, 5137).

NEW COMPOUNDS



Momordic acid

MORINDA (Rubiaceae)

M. citrifolia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 169).

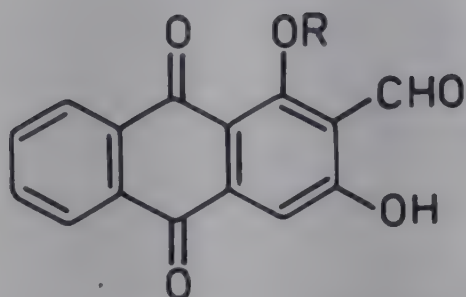
Anthraquinones - nordamnacanthal (1.7), morindone (0.5%), rubiadin, rubiadin-1-methyl ether - and a pigment, mp. 295°, from roots (*Aust. J. Chem.* 1962, 15, 332).

M. tinctoria Roxb.; see *M. tomentosa* Heyne ex Roth.

M. tomentosa Heyne ex Roth syn. *M. tinctoria* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 169).

Morindone, damnacanthal and nordamnacanthal (1,3-dihydroxy-2-formylanthraquinone) from heartwood (*J. Sci. Ind. Res.* 1959, 18B, 367); morindone diglucoside (morindonin), mp. 255°, isolated from root bark and characterised (*J. Sci. Ind. Res.* 1960, 19B, 433).

NEW COMPOUNDS

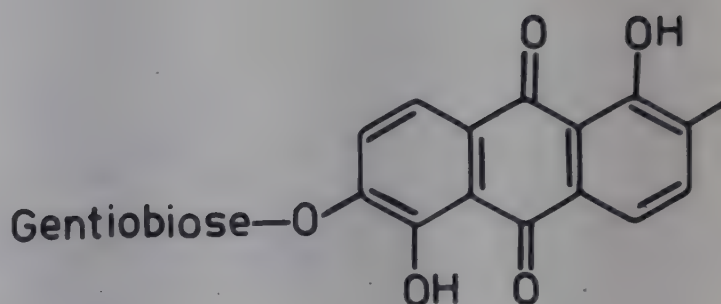


Damnacanthal

R = Me

Nordamnacanthal

R = H



Morindonin

M. umbellata L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 170).

2-Hydroxyanthraquinone, alizarin, alizarin 1-Me ether, rubiadin, rubiadin 1-Me ether, xanthopurpurin, alizarin 2-Me ether, 1-hydroxy-2-methylantraquinone, 2-methylantraquinone, munjistin and lucidin from roots and stems (*Phytochemistry* 1968, 7, 1421).

MORINGA (Moringaceae)

M. concanensis Nimmo (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 170).

Lignoceric, behenic, arachidic, stearic, palmitic, linoleic and oleic acids from seed oil (*Indian Oil Soap J.* 1968, 34, 65; *Chem. Abstr.* 1969, 71, 36387 m).

M. oleifera Lamk. syn. *M. pterygosperma* Gaertn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 170).

Aldotriouronic acid from acid hydrolysis of gum, characterised as O-(β -D-glucopyranosyluronic acid)(1 \rightarrow 6)- β -D-galactopyranosyl (1 \rightarrow 6)-D-galactose (*J. Indian Chem. Soc.* 1962, 39, 623); presence of aspartic acid, glutamic acid, glycine, threonine, alanine, valine, leucine, isoleucine, histidine, lysine, arginine, phenylalanine, tryptophan, cysteine and methionine in leaves (*Curr. Sci.* 1965, 34, 374).

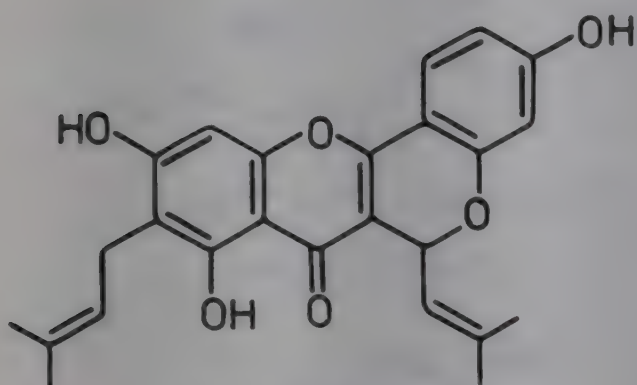
M. pterygosperma Gaertn.; see *M. oleifera* Lamk.

MORUS (Moraceae)

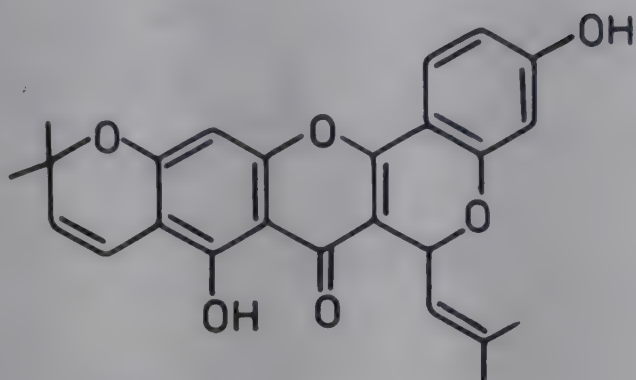
M. alba L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 170).

Mulberrin, mp. 153°, mulberrochromene, mp. 232°, cyclomulberrin, cyclomulberrochromene, mp. 233°, characterised from stems, roots and bark (*Tetrahedron Lett.* 1968, 1715).

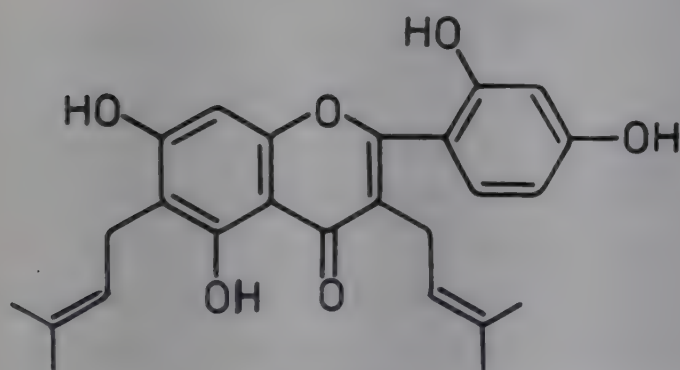
NEW COMPOUNDS



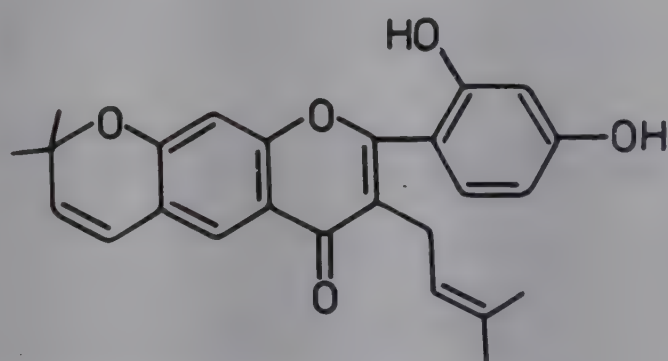
Cyclomulberrin



Cyclomulberrochromene



Mulberrin



Mulberrochromene

MUCUNA (Papilionaceae)

M. pruriens (L.) DC. syn. *M. prurita* Hook. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 171).

Plant extractive showed marked hypotensive and hypocholesterolaemic effects in normal rats (*Indian J. Med. Res.* 1968, 56, 1808).

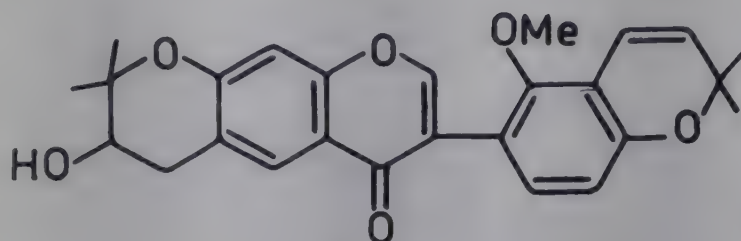
M. prurita Hook.; see *M. pruriens* (L.) DC.

MUNDULEA (Papilionaceae)

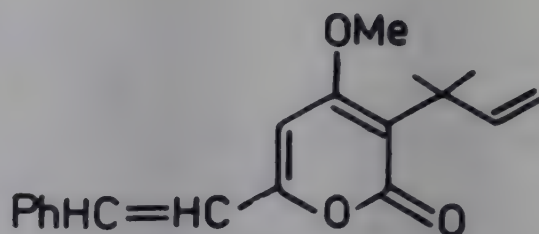
M. sericea (Willd.) A. Cheval syn. *M. suberosa* Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 171).

Unidentified compounds, mp. 103° and 153°, and an oil from root bark (*J. Sci. Ind. Res.* 1958, 17B, 384); munetone and another isoflavone - mundulone, mp. 179° - from root bark; revised structure of munetone (*J. Indian Chem. Soc.* 1959, 36, 165; *J. Indian Chem. Soc.* 1962, 39, 475; *Tetrahedron Lett.* 1963, 281); mundulea lactone, mp. 104°, characterised as 3-(α,α -dimethylallyl)-4-methoxy-6-styryl- α -pyrone (*Curr. Sci.* 1966, 35, 410).

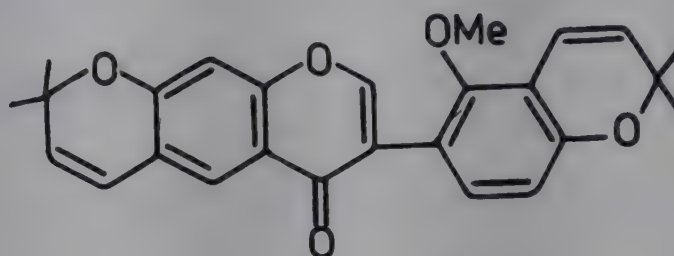
NEW COMPOUNDS



Mundulone



Mundulea lactone



Munetone

M. suberosa Benth.; see *M. sericea* (Willd.) A. Cheval

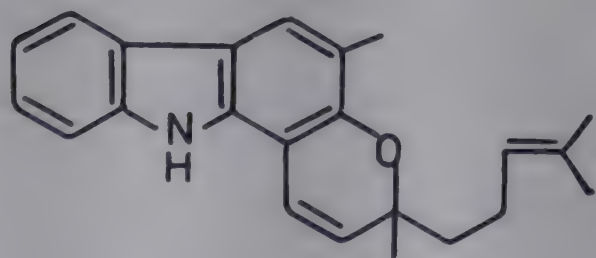
MURRAYA (Rutaceae)

M. exotica L.; see *M. paniculata* (L.) Jack

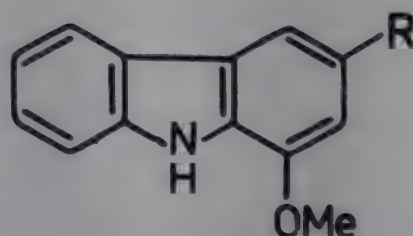
M. koenigii (L.) Spreng. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 171).

Isolation and structure of pyranocarbazole alkaloid - girinimbine, mp. 176° (*Sci. Cult.* 1964, 30, 445; *Indian J. Chem.* 1969, 7, 307); isolation and synthesis of murrayanine (3-formyl-1-methoxycarbazole), mp. 168°, from bark (*Tetrahedron* 1965, 21, 681; *Chem. Commun.* 1966, 417; new alkaloids - mahanimbine, mp. 94°, koenimbine, mp. 194° and koenigicine, mp. 224° - from fruits and leaves (*Indian J. Chem.* 1969, 7, 307; *Tetrahedron Lett.* 1968, 5501; *Experientia* 1969, 25, 790); a carbazole carboxylic acid - mukoeic acid, mp. 242° - from stem bark (*Chem. Ind.* 1969, 549); curryangine and curryanine isolated and structure of former proposed (*Indian J. Chem.* 1969, 7, 1061); cyclomahanimbine and mahanimbidine isolated from leaves and their structures proposed (*Tetrahedron Lett.* 1969, 3857).

NEW COMPOUNDS



Mahanimbine

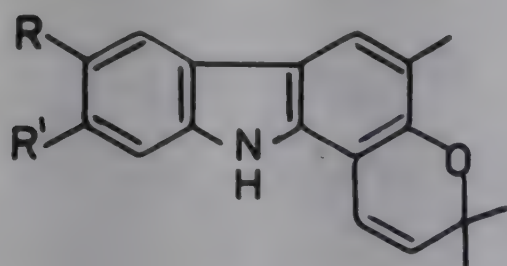


Mukoeic acid

R = COOH

Murrayanine

R = CHO



Girinimbine

R,R = H

Koenimbine

R = H, R' = OMe

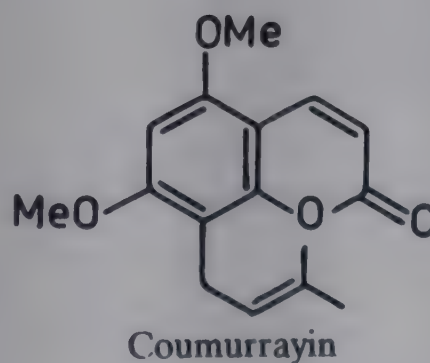
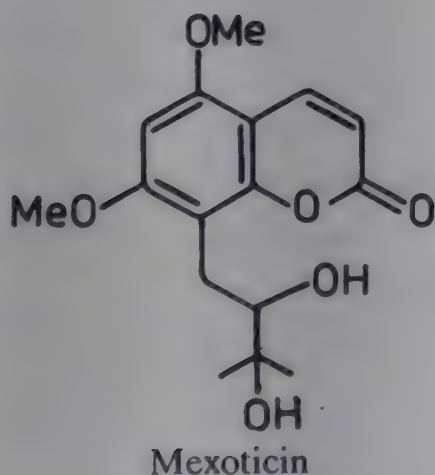
Koenigicine

R,R' = OMe

M. paniculata (L.) Jack. syn. *M. exotica* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 171).

New coumarin - mexoticin, mp. 185° - from stem bark, characterised as 5,7-dimethoxy-8-(2,3-dihydroxyisopentyl)coumarin (*Tetrahedron Lett.* 1967, 3471); coumurrayin and 3,3',4',5,5',6,7-heptamethoxyflavone isolated (*J. Org. Chem.* 1968, 33, 3574); semi- β -carotenone and β -carotenone isolated (*Phytochemistry* 1968, 7, 1031); coumurrayin isolated from fruits and characterised as 5,7-dimethoxy-8-(2-isopentenyl)coumarin (*Tetrahedron Lett.* 1968, 811).

NEW COMPOUNDS



MUSA (Musaceae)

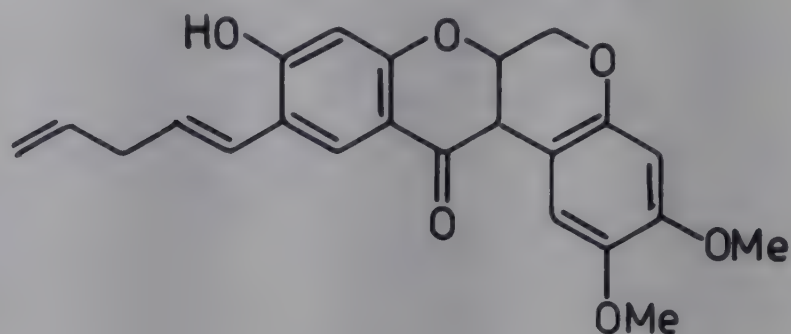
M. superba Roxb.; see *Ensete superbum* (Roxb.) Cheesman

MYRICA (Myricaceae)

M. esculenta Buch.-Ham. syn. *M. nagi* Hook.f. (non Thunb.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 172).

Myriconol, mp. 114°, isolated from stem bark and characterised (*Curr. Sci.* 1963, 32, 16); β -sitosterol, taraxerol, myricadiol, mp. 268°, from bark (*Indian J. Chem.* 1963, 1, 28).

NEW COMPOUNDS



Myriconol

BIOLOGICAL ACTIVITY

Myriconol less toxic to fish than rotenone (*Curr. Sci.* 1963, 32, 16).

M. nagi Hook.f.; see *M. esculenta* Buch.-Ham.

MYROXYLON (Papilionaceae)

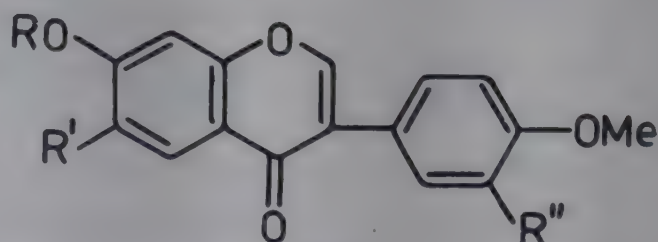
M. balsamum (L.) Harms

Eng. - Tolu balsam tree.

Carbreuvin (3',4',7-trimethoxyisoflavone), mp. 164°, isolated from wood (*Anais Assoc. Brasil. Quim.* 1959, 18, 89; *Chem. Abstr.* 1960, 54, 9911 d); a new isoflavone - afromosin - from wood (*J. Org. Chem.* 1963, 28, 881).

Distribution : Native of tropical America, introduced into India and grown in gardens as ornamental.

NEW COMPOUNDS



Afromosin

$R, R'' = H, R' = OMe$

Carbreuvin

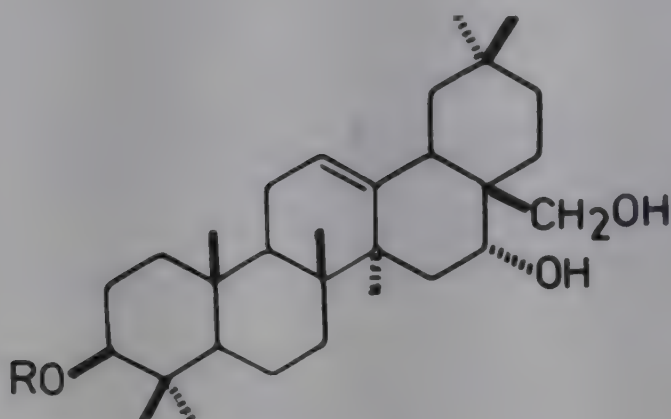
$R = Me, R' = H, R'' = OMe$

MYRSINE (Myrsinaceae)

M. africana L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 173).

Alcoholic extract of twigs and leaves showed significant inhibition of Walker carcinosarcoma 256 in rats; a new saponin - myrsine - isolated (*J. Med. Chem.* 1969, 12, 167).

NEW COMPOUNDS



Myrsine

R = Glu + Rha + Gal + Gluc..acid
(1:2:1:1)

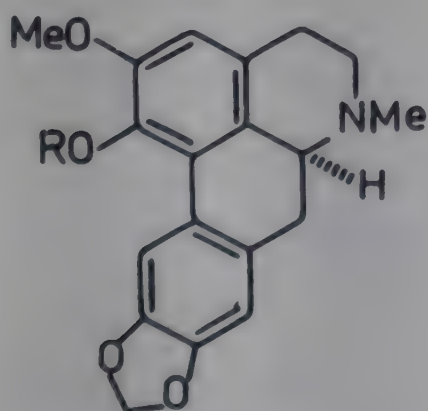
NANDINA (Nandinaceae)

N. domestica Thunb.

Nantenine (0.5%), mp. 138°, phenolic bases (0.05%) and traces of protopine in seeds, root and stem (*Tokyo Yakka Daigaku Kenkyu Nenpu* 1957, 7, 102; *Chem. Abstr.* 1960, 54, 17798 c); absolute configuration of nantenine (*Tetrahedron* 1965, 21, 395); domesticine, mp. 99°, its methyl ether, jatrorrhizine, berberine and magnoflorine from roots of Japanese var. forma Shinanten; protopine, mp. 203°, from stem (*Yakugaku Zasshi* 1960, 80, 219; *Chem. Abstr.* 1960, 54, 13162 g; *Yakugaku Zasshi* 1961, 81, 1096; *Chem. Abstr.* 1962, 56, 3564 e); a tertiary phenolic base - isoboldine, mp. 178° dec. - isolated (*Nippon Kagaku Zasshi* 1961, 82, 1708; *Chem. Abstr.* 1963, 59, 7571 c; *Yakugaku Zasshi* 1962, 82, 1457; *Chem. Abstr.* 1963, 58, 11685 b); crystal structure of isoboldine (*Acta Crystallog. Sec. B* 1977, 33, 2051).

Distribution : Native of China and Japan, often cultivated in Assam gardens and elsewhere.

NEW COMPOUNDS

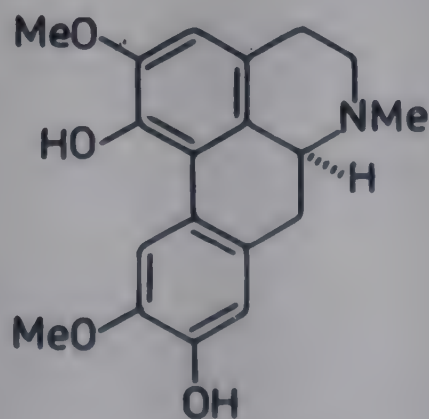


Nantenine

R = Me

Domesticine

R = H



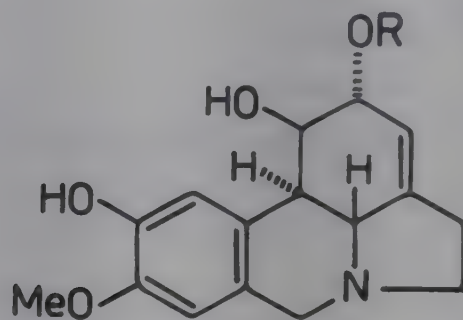
Isoboldine

NARCISSUS (Amaryllidaceae)*N. jonquilla* L.

Eng. - Jonquil.

Alkaloids - goleptine, mp. 141° and golceptine, mp. 146° - isolated and characterised (*Arch. Pharm.* 1964, 297, 39; *Chem. Abstr.* 1964, 60, 10733 e).

Distribution : Ornamental, grown in gardens.

NEW COMPOUNDS

Goleptine

R = Me

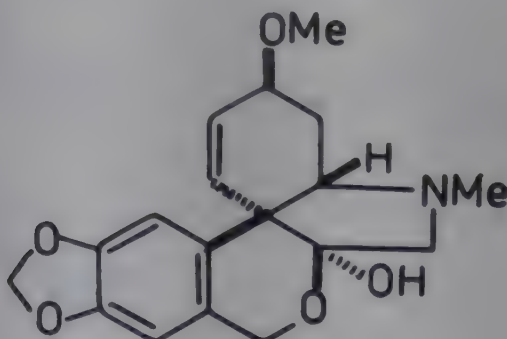
Golceptine

R = H

N. tazetta L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 173).

Extract of bulb showed *in vivo* antiviral activity in mice and culture of KB cells infected with lymphocytic choriomeningitis virus (*Proc. Soc. Exp. Biol. Med.* 1967, 125, 234).

Lycorine, tazettine and pancratine from leaves and bulbs (*Khim. Prir. Soedin.* 1967, 3, 64; *Chem. Abstr.* 1967, 67, 22057 j); configuration and crystal structure of tazettine (*Tetrahedron Lett.* 1966, 4099; *J. Chem. Soc. B* 1971, 1070).

NEW COMPOUNDS

Tazettine

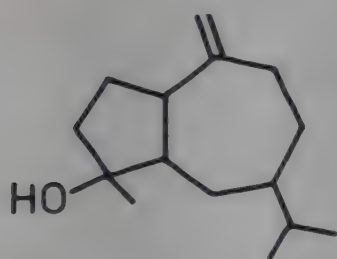
NARDOSTACHYS (Valerianaceae)

N. jatamansi DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 173).

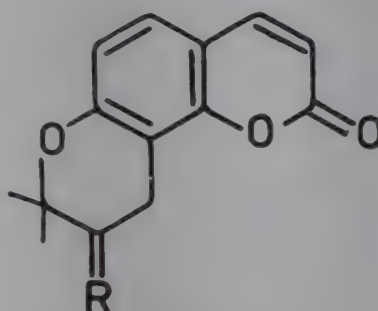
New sesquiterpene ketone - jatamansone - isolated from rhizomes (*Chem. Ber.* 1958, 91,

908; *Tetrahedron Lett.* 1959, 5); β -maaliene (18.0) and calarene (65.0%) from oil (*Tetrahedron Lett.* 1962, 827); a new terpenic coumarin - jatamansin, mp. 97° - and oroselol, mp. 148° , from roots (*Tetrahedron* 1964, 20, 2605); α -pinene, β -pinene, 3-carene, β -eudesmol, mp. 68° , elemol, mp. 48° , a C₃₀-hydrocarbon, β -sitosterol, jatamansin, angelicin, mp. 137° , and jatamansinol, mp. 182° , from roots (*Tetrahedron* 1965, 21, 3591); nardol, bp. $120^{\circ}/0.5$ mm., from roots (*Tetrahedron Lett.* 1966, 1035); a new diethenoid bicyclic ketone - nardos-tachone - from roots (*Tetrahedron* 1967, 23, 2491).

NEW COMPOUNDS



Nardol



Jatamansone

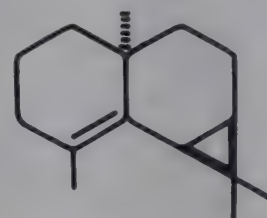
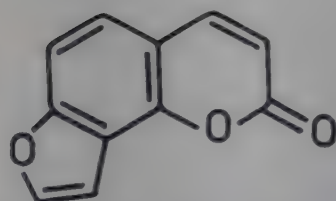
R = O

Jatamansinol

R = H, OH

Jatamansin

R = H, OCOCMe = CHMe

 β -Maaliene

Angelicin

BIOLOGICAL ACTIVITY

Jatamansone showed marked tranquillising activity in mice at doses of 30-300 mg/kg i.p. Pentobarbital anaesthesia was potentiated by 10-100 mg/kg of jatamansone. It had antiemetic activity in dogs and reduced aggressiveness in monkeys. LD₅₀ in mice 580 mg/kg i.p. (*Life Sci.* 1962, 1, 225; *Chem. Abstr.* 1963, 58, 853 h).

NAREGAMIA (Meliaceae)

N. alata Wight & Arn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 174).

Heneicosane, mp. 40° , β -sitosterol, stearic and palmitic acids from stems and roots (*J. Indian Chem. Soc.* 1965, 42, 649).

NARINGI (Rutaceae)

N. crenulata (Roxb.) Nicolson syn. *Limonia crenulata* Roxb., *L. acidissima* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 154).

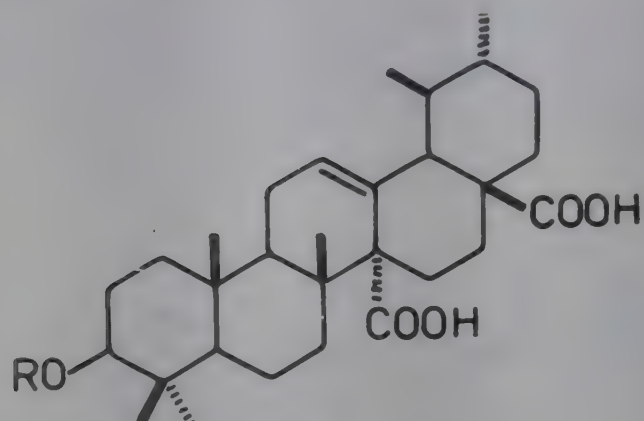
Luvangetin, mp. 105° , isolated from leaves (*J. Indian Chem. Soc.* 1968, 45, 279).

NAUCLEA (Rubiaceae)

N. orientalis (L.) L. syn. *Sarcocephalus cordatus* Miq. (*Glossary Indian Med. Plants*, Chopra Nayar & Chopra, PID, New Delhi, 1956, p. 174).

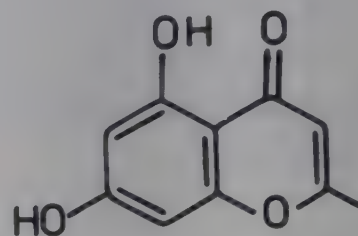
β -Sitosterol, noreugenin, palmitic acid and a new triterpene glycoside - naucleoside - isolated (*Chem. Pharm. Bull.* 1967, 15, 1682).

NEW COMPOUNDS



Naucleoside

R = Rha-Xyl



Noreugenin

NELUMBIUM (Nymphaeaceae)

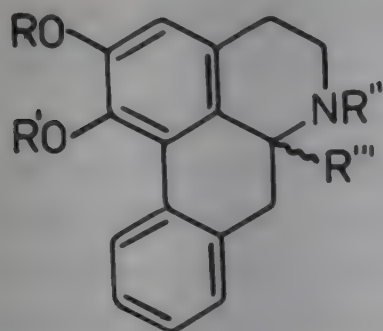
N. speciosum Willd.; see *Nelumbo nucifera* Gaertn.

NELUMBO (Nymphaeaceae)

N. nucifera Gaertn. syn. *Nelumbium speciosum* Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 174).

Raffinose and stachyose from rhizomes (*Gifu Daigaku Nogakubu Kenkyu Hokoku* 1959, 11, 133; *Chem. Abstr.* 1960, 54, 25070 g); nelumboside (0.1%), mp. 174°, from leaves, characterised as quercetin-3-glucoglucuronide (*Yakugaku Zasshi* 1961, 81, 1158; *Chem. Abstr.* 1962, 56, 1527 d); nornuciferine, mp. 186°, nuciferine, mp. 164°, roemerine, mp. 100°, dl-armepavine oxalate, mp. 210°, pronuciferine, mp. 127°, anonaine, mp. 122° and 5-methoxy-6-hydroxyaporphine, mp. 201°, from leaves and seeds (*Yakugaku Zasshi* 1961, 81, 1202; *Chem. Abstr.* 1962, 56, 3564 g; *Yakugaku Zasshi* 1961, 81, 469; *Chem. Abstr.* 1961, 55, 18015 d; *Yakugaku Zasshi* 1961, 81, 1644; *Chem. Abstr.* 1962, 57, 8625 c; *Yakugaku Zasshi* 1962, 82, 1458; *Chem. Abstr.* 1963, 58, 11685 b; *Yakugaku Zasshi* 1964, 84, 1141; *Chem. Abstr.* 1965, 62, 5307 e; *Helv. Chim. Acta* 1964, 47, 2119; *Yakugaku Zasshi* 1966, 86, 75; *Chem. Abstr.* 1966, 64, 13093 b); nornuciferine characterised as 1-methoxy-2-hydroxyaporphine (*Yakugaku Zasshi* 1961, 81, 942; *Chem. Abstr.* 1961, 55, 27393 b); mass spectroscopic studies on pronuciferine and stepharine (*Tetrahedron Lett.* 1965, 2325); liensinine, mp. 95°, isolated and its structure elucidated (*Sci. Sinica* 1962, 11, 215; *Chem. Abstr.* 1962, 57, 7383 i; *Sci. Sinica* 1962, 11, 321; *Chem. Abstr.* 1963, 58, 3467 a); kaempferol-3-glycoside, mp. 192°, isolated (*Naturwiss.* 1962, 49, 327; *Chem. Abstr.* 1962, 57, 10224 g); a new phenolic dibenzylisoquinoline alkaloid - isoliensinine - isolated (*Tetrahedron Lett.* 1964, 2637; *Chem. Pharm. Bull.* 1965, 13, 39); a new base - neferine - isolated from embryo (*Yakugaku Zasshi* 1965, 85, 335; *Chem. Abstr.* 1965, 63, 4351 b); a quaternary base - lotusine - along with isoliensinine isolated from embryo; structure of former determined (*Yakugaku Zasshi* 1965, 85, 472; *Chem. Abstr.* 1965, 63, 5692 c).

NEW COMPOUNDS



Anonaine

$R, R' = \text{CH}_2, R'' = \text{H}, R''' = \beta\text{-H}$

Nuciferine

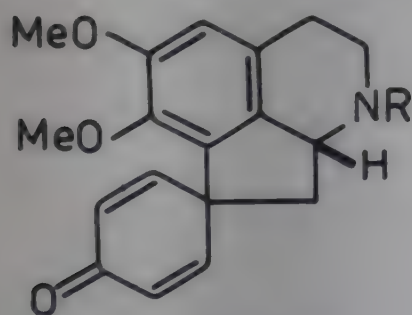
$R, R', R'' = \text{Me}, R''' = \beta\text{-H}$

Nornuciferine

$R, R' = \text{Me}, R'' = \text{H}, R''' = \beta\text{-H}$

Roemerine

$R, R' = \text{CH}_2, R'' = \text{Me}, R''' = \alpha\text{-H}$

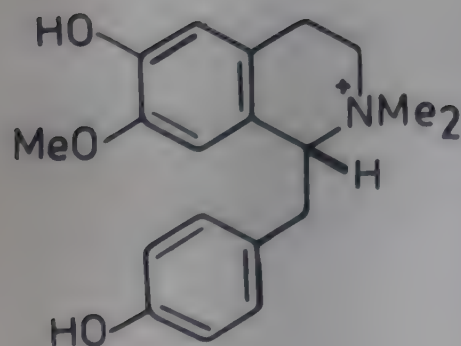


Pronuciferine

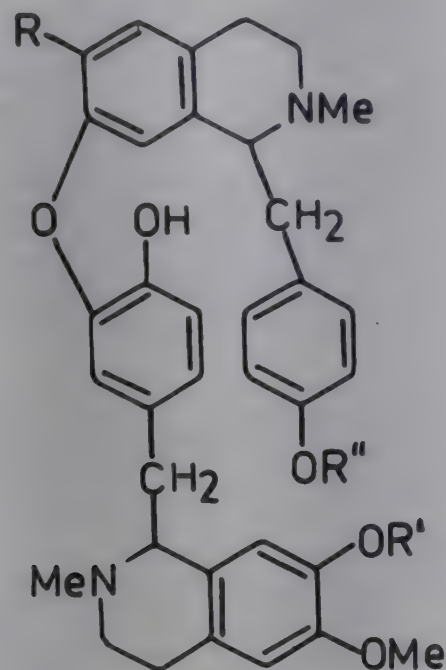
$R = \text{Me}$

Stepharine

$R = \text{H}$



Lotusine



Liensinine

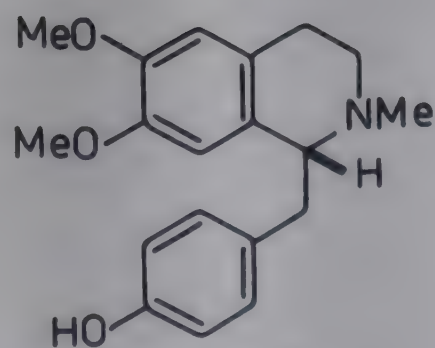
$R, R'' = \text{H}, R' = \text{Me}$

Isoliensinine

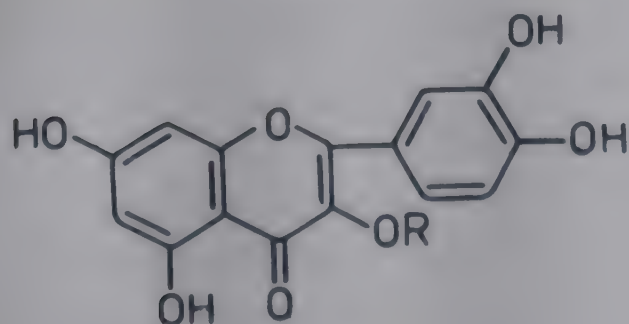
$R = \text{OMe}, R' = \text{H}, R'' = \text{Me}$

Neferine

$R = \text{OMe}, R', R'' = \text{Me}$



Armepavine



Nelumboside

$R = \text{Glu-Gluc.acid}$

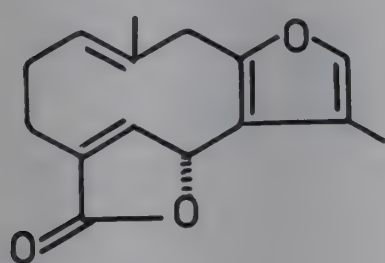
NEOLITSEA (Lauraceae)

N. cassia (L.) Kostermans syn. *Litsea zeylanica* Nees, *Neolitsea zeylanica* (Nees) Merrill.

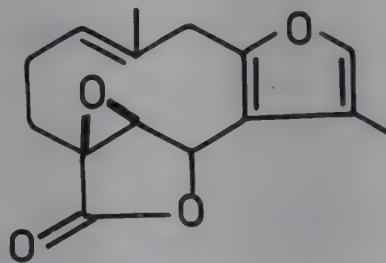
Mar. - Kanvel, Chirchira; Tel. - Akupatricum; Tam. - Molaga shembaga - palei; Kan. Bilinisangi, Massimara; Mal. - Vayana.

New sesquiterpenes - zeylanine, zeylanicine, zeylanidine, linderalactone, linderane and neolinderane - from roots (*Tetrahedron* 1967, 23, 261; *ibid.* 1967, 23, 273; *ibid.* 1967, 23, 267); absolute configuration of neolinderane (*Chem. Commun.* 1968, 1168); absolute configuration of zeylanine (*Chem. Commun.* 1968, 940); absolute configuration of linderalactone (*J. Chem. Soc. C* 1969, 1491).

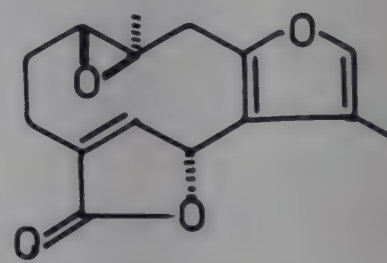
Distribution : Eastern Himalayas, Khasi Hills, Western Ghats upto 2100 m.

NEW COMPOUNDS

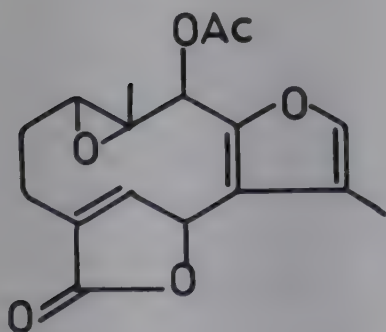
Linderalactone



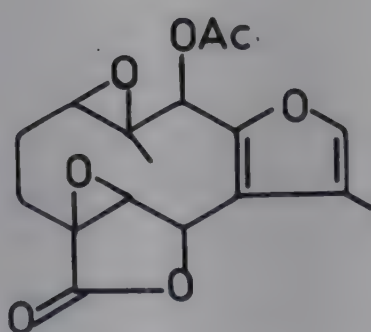
Linderane



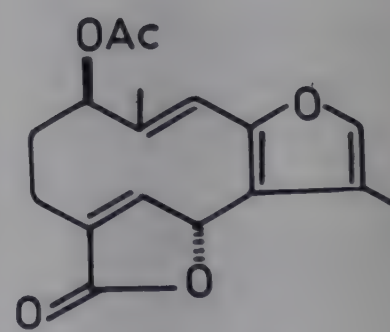
Neolinderane



Zeylanicine



Zeylanidine



Zeylanine

N. cuipala (D. Don) Kostermans syn. *Litsea lanuginosa* (Wall ex Nees) Nees.

Leaf essential oil contained cineole, 1-linalool, dl-carvone, an unidentified bicarbocyclic sesquiterpene and a hydrocarbon (*Soap Perfum. Cosmet.* 1965, 38, 254; *Chem. Abstr.* 1965, 63, 11244 f).

Distribution : Himalayas from Kashmir to Sikkim, alt. 900-1800 m. and Khasi Hills.

N. pallens (D. Don) Momiyama & Hara syn. *Litsea umbrosa* Nees var. *consimilis* (Nees) Hook.f., *Litsea consimilis* (Nees) Nees.

β -Amyrin and β -sitosterol identified in bark (*J. Indian Chem. Soc.* 1967, 44, 156).

Distribution : Eastern and western Himalayas, alt. 1500-2000 m.

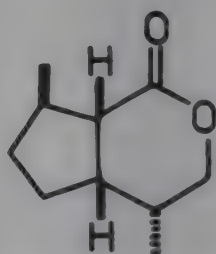
N. zeylanica (Nees) Merrill; see *N. cassia* (L.) Kostermans

NEPETA (Lamiaceae)

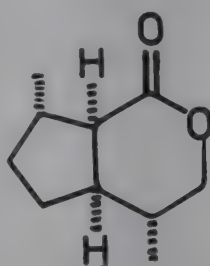
N. cataria L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 174).

New sesquiterpene lactones - dihydronepetalactone and isodihydronepetalactone - isolated and structures elucidated (*Tetrahedron Lett.* 1965, 4097); separation of nepetalactone, epinepetalactone and their degradation products (dimethylnepetalinates) by GLC (*Phytochemistry* 1967, 6, 1271); nepetalactone, epinepetalactone and caryophyllene from essential oil (*Phytochemistry* 1967, 6, 1281).

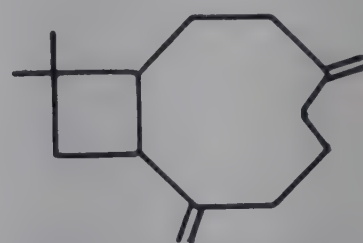
NEW COMPOUNDS



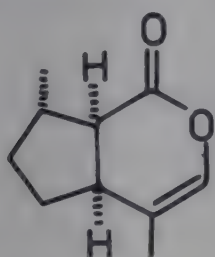
Dihydronepetalactone



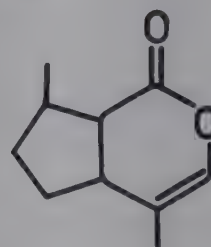
Isodihydronepetalactone



Caryophyllene



Nepetalactone

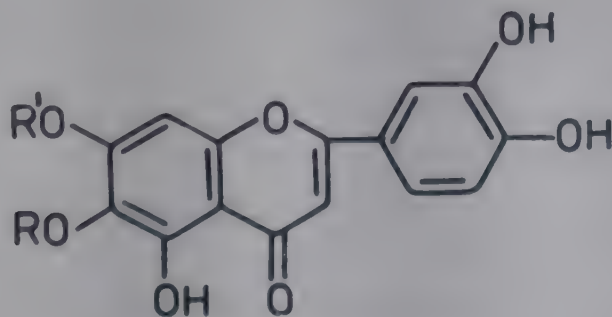


Epinepetalactone

N. hindostana (Roth) Haines syn. *N. ruderalis* Buch.-Ham. ex Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 175).

A new flavone glucoside - nepitrin, mp. 254° - isolated; structure of pedalin revised as 6-glucoside of 6-hydroxyluteolin-7-methyl ether (*Indian J. Chem.* 1968, 6, 676).

NEW COMPOUNDS



Nepitrin

R = Me, R' = Glu

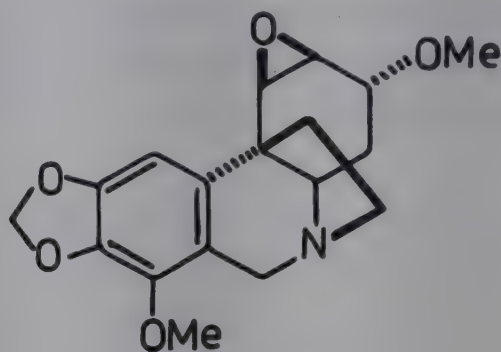
Pedalin

R = Glu, R' = Me

N. ruderalis Buch.-Ham. ex Benth.; see *N. hindostana* (Roth) Haines

NERINE (Amaryllidaceae)*N. undulata* Herb.Stereostructure of alkaloid - undulatine - from bulbs (*J. Am. Chem. Soc.* 1960, 82, 1472).

Distribution : Grown in gardens as ornamental plant.

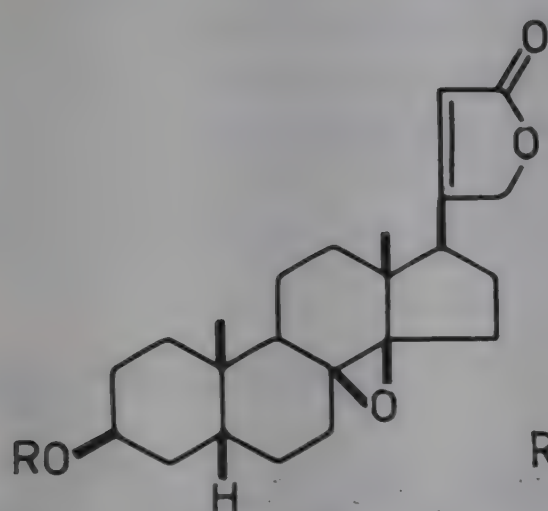
NEW COMPOUNDS

Undulatine

NERIUM (Apocynaceae)*N. indicum* Mill. syn. *N. odorum* Soland. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 175).Ursolinic acid, oleandrin and neriodorin, mp. 204°, isolated (*Pharm. Zentralhalle* 1966, 105, 148; *Chem. Abstr.* 1966, 64, 18032 b).*N. odorum* Soland.; see *N. indicum* Mill.*N. oleander* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 175).

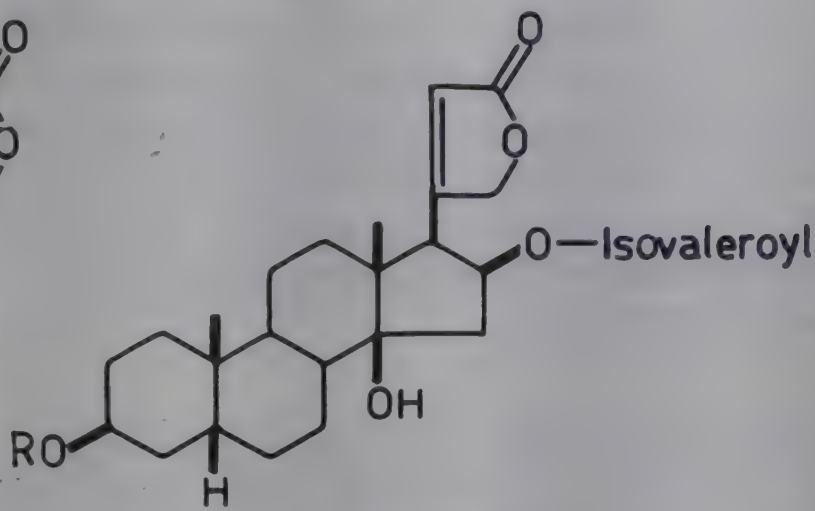
Strospeside, mp. 243°, odorosides A, B and H, mp. 238°, digitalinum verum, odorobioside G, odorobioside K, anhydrodigitalinum verum, odorobioside D, odorotrioside K and odoroside G isolated from seeds; oleandrin isolated from leaves but not found in seeds (*J. Pharm. Belg.* 1959, 14, 263; *Chem. Abstr.* 1960, 54, 8650 h; *J. Pharm. Belg.* 1959, 14, 376; *Chem. Abstr.* 1960, 54, 14577 g; *Boll. Chim. Farm.* 1964, 103, 423; *Chem. Abstr.* 1964, 61, 11003 a; *Naturwiss.* 1964, 57, 139; *Chem. Abstr.* 1964, 61, 534 c); separation of odorobiosides G and K and odorotriosides G and K and oleandrin by PC (*J. Pharm. Belg.* 1959, 14, 447; *Chem. Abstr.* 1960, 54, 15834 g); in addition, detection of anhydrostrospeside, gitoxigenin and digitoxigenin by PC in hulls (*J. Pharm. Belg.* 1959, 14, 376; *Chem. Abstr.* 1960, 54, 14577 g; *Naturwiss.* 1964, 57, 139; *Chem. Abstr.* 1964, 61, 534 c); detection of flavonoid compounds (0.5), cardiotonic glucosides (0.55), rutin (90%) and principal cardiac glycoside - gluco-oleandrin - in extract of leaves (*Planta Med.* 1961, 9, 442); deacetyloleandrin, adynerin, neriantin, neritaloside, urechitoxin from leaves (*Naturwiss.* 1964, 57, 139; *Chem. Abstr.* 1964, 61, 534 c; *Corriere Farm.* 1966, 21, 417; *Chem. Abstr.* 1967, 67, 41004 f); neriin and folinerin from leaves, flowers and bark (*Corriere Farm.* 1966, 21, 417; *Chem. Abstr.* 1967, 67, 41004 f); rutin, quercitrin and quercetin from flowers (*Ciencia* 1967, 25, 103; *Chem. Abstr.* 1967, 67, 29846 z); adigoside, mp. 211° and eighteen compounds from seeds (*Helv. Chim. Acta* 1966, 49, 1855).

NEW COMPOUNDS



Adynerin

R = Diginose



Adigoside

R = Diginose

BIOLOGICAL ACTIVITY

Oleandrin showed digitalis-like action on isolated heart of frog, guinea pig, rabbit and cat. In guinea pig the lethal dose of oleandrin and strophanthin was 1.333 and 0.779 mg/kg i.v. respectively. Oleandrin showed emetic action in pigeons and fatal dose was 500 γ /kg (*Arch. Int. Pharmacodyn. Ther.* 1952, 139, 42; *Chem. Abstr.* 1963, 58, 1822 e).

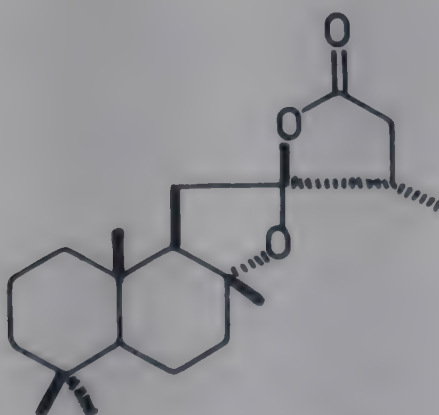
Note: *N. indicum* and *N. oleander* are commonly treated as separate species. However, some are inclined to consider them conspecific.

NICOTIANA (Solanaceae)

N. rustica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 176).

Isolation and characterisation of α_2 -levantanolide, mp. 165° (*Tetrahedron* 1963, 19, 107).

NEW COMPOUNDS

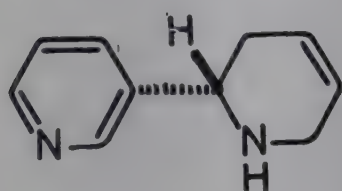
 α_2 -Levantanolide

N. tabacum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 1956, 176).

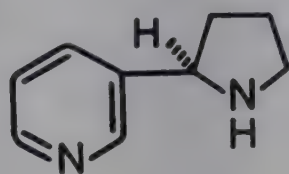
Anatabine and (+)nornicotine, bp. 111°/1.5 mm., from roots (*Naturwiss.* 1960, 47, 540; *Chem. Abstr.* 1961, 55, 10605 f); quercetin-3,3'-dimethyl ether and quercetin-3-Me ether from

flowers (*J. Org. Chem.* 1960, 25, 2063); three new gibberellins - nicotiana α , β and γ - along with gibberellins A and A3 from shoot apices and flower buds (*Phytochemistry* 1965, 4, 49); a new α , β -unsaturated aldehyde - 3,7,13-trimethyl-10-isopropyl-2,6,11,13-tetradecatetraen-1-al (I) from flowers (*Tetrahedron Lett.* 1967, 459); S(-)-2-isopropyl-5-oxohexanoic acid from leaves; absolute configuration of solenone (*Agr. Biol. Chem.* 1967, 31, 607; *Chem. Abstr.* 1967, 67, 71214 s); a new alkaloid - anatalline mp. 244° - isolated and characterised as 2,4-di(3-pyridyl) piperidine (*Phytochemistry* 1968, 7, 323).

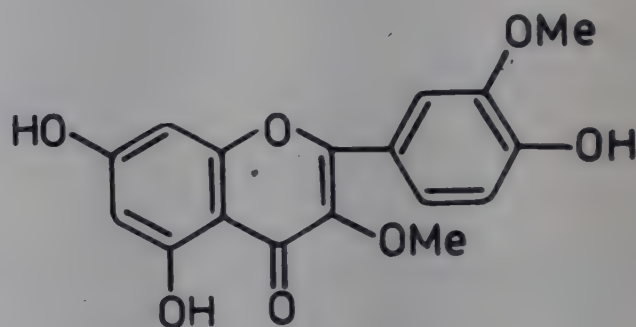
NEW COMPOUNDS



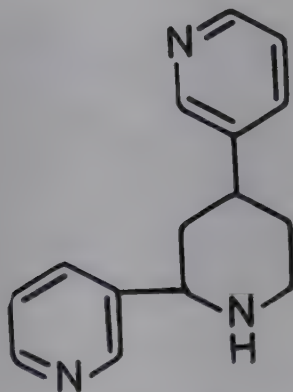
Anatabine



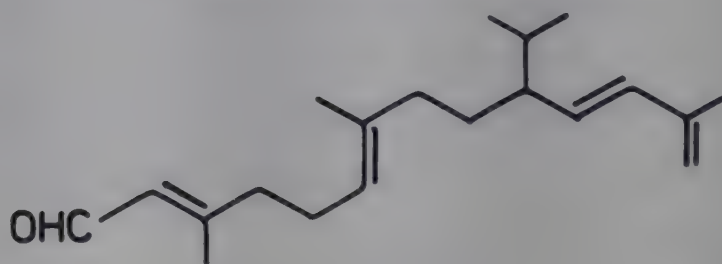
(+)Nornicotine



Quercetin-3,3'-dimethyl ether



Anatalline



I

NIGELLA (Ranunculaceae)

N. sativa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 176).

Essential oil protected guinea pig against histamine-induced bronchospasms (*J. Pharm. Sci. U.A.R.* 1960, 1, 9; *Chem. Abstr.* 1962, 56, 6091 g).

Nigellone isolated from essential oil (*Egypt. Pharm. Bull.* 1960, 42, 411; *Chem. Abstr.* 1963, 58, 3790 b).

BIOLOGICAL ACTIVITY

Nigellone protected guinea pig against bronchospasms induced by inhaling sprays containing histamine. It had little effect on circulation in isolated toad or mammalian heart and did not affect blood pressure in dog or cat (*Egypt. Pharm. Bull.* 1960, 42, 411; *Chem. Abstr.* 1963, 58, 3790 b).

NYCTANTHES (Oleaceae)

N. arbor-tristis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 177).

Two flavonol glycosides - astragalin and nicotiflorin - from leaves (*Bull. Nat. Inst. Sci. India*

1965, 41; *Chem. Abstr.* 1967, 66, 26562 x).

NYMPHAEA (Nymphaeaceae)

N. alba L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 177).

Presence of two alkaloids in leaves and flowers and one alkaloid in roots shown by PC (*Acta Pol. Pharm.* 1964, 21, 121; *Chem. Abstr.* 1965, 62, 12152 b).

NYMPHOIDES (Gentianaceae)

N. peltatum (S.G. Gmel.) Kuntze. syn. *Limnanthemum nymphaeoides* Hoffm. & Link (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 178).

Rutin and a glycoside, mp. 200°, from leaves; latter characterised as α -L-arabinopyranosido-(1 \rightarrow 6)- β -D-glucopyranosyl-3-quercetin(β -vicianosyl-3-quercetin) (*C.R. Acad. Sci. Paris, Ser. D* 1969, 268, 1661; *Chem. Abstr.* 1969, 70, 118021 f).

OCHROCARPUS (Clusiaceae)

O. longifolius Benth. & Hook.f.; see *Mammea suriga* (Ham. ex Roxb.) Kosterm.

OCIMUM (Lamiaceae)

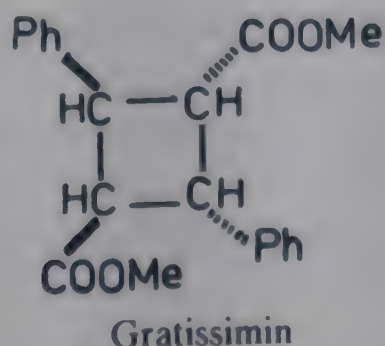
O. basilicum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 178).

Me cinnamate, methylchavicol, linalool, cineole, ocimene, borneol, sambulene and safrole obtained from essential oil (*Riechst. Aromen, Koerperpflegem.* 1968, 18, 169; *Chem. Abstr.* 1968, 69, 38701 s).

O. gratissimum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 179).

Eugenol (63.5), ocimene (14.8), (-)-cadinene (4.0) and (-)-perillyl alcohol (3.1%) from essential oil (*Chemistry (Taipei)* 1962, 5; *Chem. Abstr.* 1963, 58, 3266 e); isolation of ocimol, mp. 310° and gratissimin, mp. 176°, from leaves (*Sci. Res.* 1964, 1, 217; *Chem. Abstr.* 1965, 62, 8119 g); characterisation of gratissimin as dimethyl ester of α -truxillic acid (*Sci. Res.* 1965, 2, 8; *Chem. Abstr.* 1965, 63, 11416 g).

NEW COMPOUNDS



O. kilimandscharicum Guerke

Eng. - Camphor basil; H. - Kapur tulsi; B. - Karpur tulsi.

A method described to obtain camphor from leaves by steam distillation (*Bull. Calcutta Sch. Trop. Med.* 1959, 7, 103; *Chem. Abstr.* 1960, 54, 12494 d).

Distribution : Native of Kenya, introduced and cultivated in India.

ODINA (Anacardiaceae)

O. woodier Roxb.; see *Lannea coromandelica* (Houtt.) Merr.

ODONTITES (Scrophulariaceae)

O. serotina (Lamk.) Dum. syn. *Bartsia odontites* Hook.f. (non Huds.)

Two alkaloids, mp. 211° and 193°, isolated (*Med. Prom. SSSR* 1963, 17, 17; *Chem. Abstr.* 1965, 62, 1968 d).

Distribution : Kashmir, alt. 2100-2400 m.

OENANTHE (Umbelliferae)

O. javanica (Bl.) DC. syn. *O. stolonifera* (Roxb.) Wall. ex DC.

B. - Pan turasi; Mundari - ependung.

Flavonoids - persicarin, mp. 288°, quercetin and rutin - from petals (*Nippon Nogei Kagaku Kaishi* 1965, 39, 317; *Chem. Abstr.* 1966, 64, 1012 g).

Distribution : North India from Kashmir to Assam ascending to an alt. of 1800 m. and plains of Bengal.

O. stolonifera (Roxb.) Wall. ex DC.; see *O. javanica* (Bl.) DC.

OLDENLANDIA (Rubiaceae)

O. biflora L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 180).

Presence of alkaloids, fumaric acid, glucose, fructose, lactose and a long chain alcohol, mp. 75° (*Vijnana Parishad Anusandhan Patrika* 1959, 2, 169; *Chem. Abstr.* 1961, 55, 904 e); three compounds, mp. 75°, 81° and 84°, isolated from plant (*Vijnana Parishad Anusandhan Patrika*, 1966, 9, 95; *Chem. Abstr.* 1967, 67, 114362 h).

O. corymbosa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 180).

Isolation of γ -sitosterol, oleanolic and ursolic acids (*J. Am. Pharm. Assoc. Sci. Ed.* 1960, 49, 562; *Chem. Abstr.* 1960, 54, 23193 i).

O. diffusa (Willd.) Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 180).

Isolation of hentriacontane, stigmasterol, ursolic and oleanolic acids along with three other substances, mp. 138°, 167° and 211° (*Yao Hsueh Hsueh Pao* 1964, 11, 809; *Chem. Abstr.* 1965,

62, 6804 e); β -sitosterol, its glucoside and p-coumaric acid isolated (Yao Hsueh Hsueh Pao 1966, 13, 181; *Chem. Abstr.* 1966, 65, 7631 c).

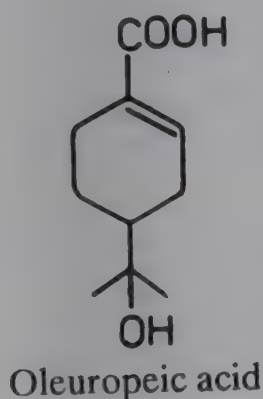
O. umbellata L.; see *Hedyotis umbellata* (L.) Lamk.

OLEA (Oleaceae)

O. europaea L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 180).

Isolation of new triterpenic acid, mp. 240° , from olive cakes (*Atti Acad. Naz. Lincei Rend. Cl. Sci. Fis. Mat. Nat.* 1960, 29, 544; *Chem. Abstr.* 1962, 56, 7369 e); oleuropeic acid, the aglycone of 6-O-oleuropeoylsucrose from root bark, characterised as [4-(1-hydroxyisopropyl)-1-cyclohexene-1-carboxylic acid] (*Tetrahedron Lett.* 1966, 5673).

NEW COMPOUNDS



OLEANDRA (Oleandraceae)

O. musaefolia (Bl.) Presl syn. *O. neriiformis* sensu Bedd. Ferns South India 32, t. 91, 1863 (non Cav.), *O. neriifolia* sensu Bedd. (non Cav.)

A new triterpene alcohol - neriifoliol - isolated (*Tetrahedron Lett.* 1967, 1353); filicine, n-octacosanollignocerate, β -sitosterol and neriifoloxide, mp. 210° , from rhizomes, leaves and roots (*Phytochemistry* 1969, 8, 1607).

Distribution : South India.

O. neriifolia Cav.; see *O. musaefolia* (Bl.) Presl

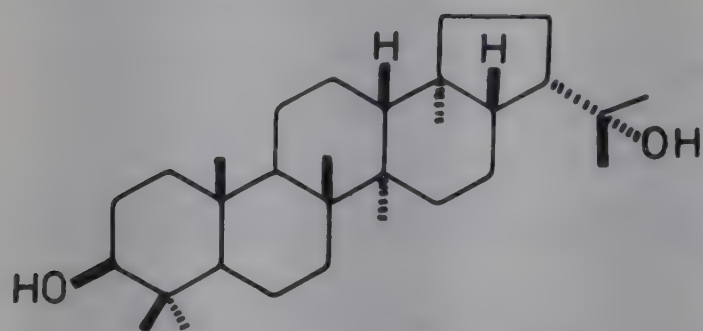
O. neriiformis Cav.; see *O. musaefolia* (Bl.) Presl

O. wallichii (Hook.) Presl

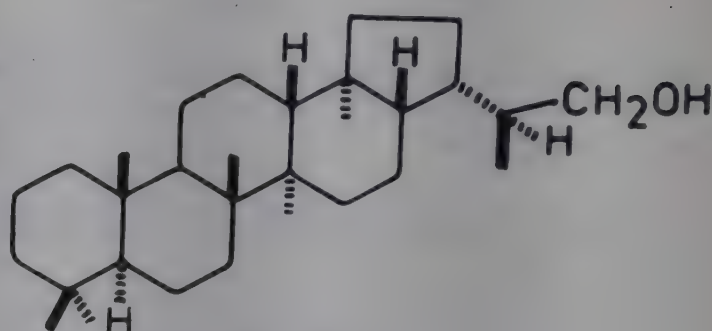
Triterpene hydrocarbons - wallichiene, mp. 196° and wallichienene, mp. 210° - isolated (*Tetrahedron Lett.* 1967, 4683); isolation and structure determination of neriifoliol (*Tetrahedron Lett.* 1967, 1353, 4683); isolation of wallichiniol, mp. 310° (possibly 22-epimer of $3\beta,22$ -hopanediol), its acetate, mp. 315° , a dihydroxy triterpene - hopane- $3\beta,22$ -diol, mp. 292° - β -sitosterol and sucrose; their structures elucidated (*Phytochemistry* 1969, 8, 327).

Distribution : Western and eastern Himalayas and Meghalaya from 600-2400 m.

NEW COMPOUNDS



Hopane-3 β ,22-diol
Wallichinol (22-epimer)



Neriifoliol

OLIGOCHAETA (Asteraceae)

O. ramosa (Roxb.) Wagenitz syn. *Amberboa divaricata* (DC.) Kuntze, *Volutarella divaricata* Benth. & Hook.f. p.p., *Tricholepis procumbens* Wt. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 15).

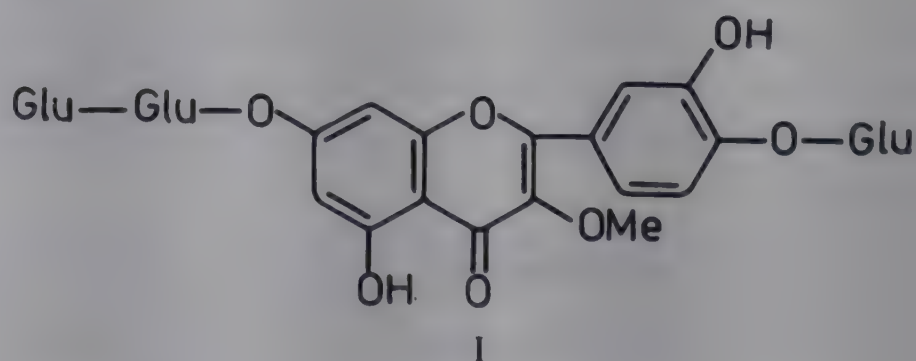
A glucoside - procumbenin - isolated (*Vijnana Parishad Anusandhan Patrika* 1968, 11, 81; *Chem. Abstr.* 1969, 71, 98984 n).

OPHIOGLOSUM (Ophioglossaceae)

O. vulgatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 181).

Isolation of a new flavonol triglycoside - 3-O-methylquercetin-7-O-diglucosido-4'-O-glucoside (I) (*Phytochemistry* 1969, 8, 469).

NEW COMPOUNDS

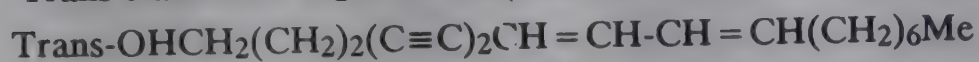
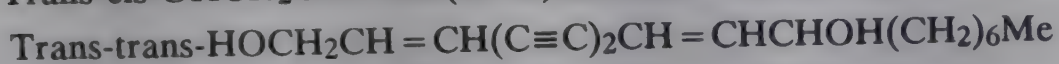
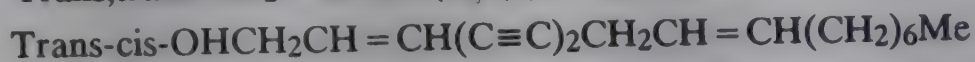
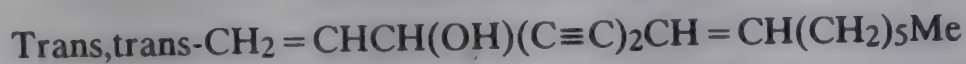


OPOPANAX (Apiaceae)

O. chironium Koch (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 181).

Isolation and characterisation of a number of new biogenetically related C-17 polyene compounds (*Chem. Ber.* 1968, 101, 525).

NEW COMPOUNDS



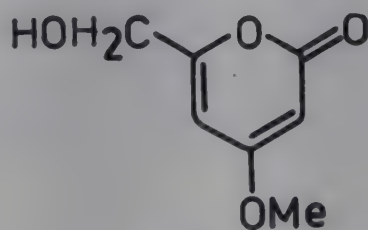
OPUNTIA (Cactaceae)

O. dillenii (Ker-Gawl.) Haw.; see *O. elatior* Mill.

O. elatior Mill. syn. *O. dillenii* auct. pl. [non (Ker-Gawl.) Haw.] (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 181).

Isolation of isoquercitrin (0.2%) (*Curr. Sci.* 1964, 33, 211); β -sitosterol, opuntiol, mp. 180° , opuntiol acetate, mp. 110° , isolated; structure of opuntiol determined (*Tetrahedron* 1965, 21, 93); glucoside - narcissin, mp. 180° - from flowers (*J. Indian Chem. Soc.* 1968, 45, 81).

NEW COMPOUNDS



Opuntiol

ORIGANUM (Lamiaceae)

O. vulgare L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 182).

Presence of α -thujene, camphene, β -pinene, myrcene, α -phellandrene, α -terpinene and ocimene in essential oil (*Planta Med. Suppl.* 1967, 96).

OROXYLUM (OROXYLON) (Bignoniaceae)

O. indicum (L.) Vent. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 182).

Bark extract decreased capillary permeability in rats sensitised by egg albumin. It suppressed inflammation caused by egg albumin in intact and adrenalectomised rats (*Rast. Resur.* 1967, 3, 446; *Chem. Abstr.* 1968, 68, 20810 w).

ORYZA (Poaceae)

O. sativa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 182).

Flavonoid pigments analysed by PC and paper electrophoresis; glucotricin, mp. 260°, isolated from leaves (*Agric. Biol. Chem.* 1965, 29, 428; *Chem. Abstr.* 1965, 63, 6018 g).

OUGEINIA (Papilionaceae)

O. dalbergioides Benth.; see *O. oojeinensis* (Roxb.) Hochr.

O. oojeinensis (Roxb.) Hochr. syn. *O. dalbergioides* Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 183).

5,7,2',4'-Tetrahydroxyisoflavanone, homoferreirin and ougenin (5,2',4'-trihydroxy-7-methoxy-6-methylisoflavanone) isolated from heartwood (*Proc. Royal Soc.* 1962, 268, 1; *Chem. Abstr.* 1962, 57, 7628 h); lupeol and a hydroxylupeol, mp. 247°, from stem bark (*Sci. Cult.* 1963, 29, 151); lupeol and betulin from bark (*Trans. Bose Res. Inst.* 1963, 26, 55); *Chem. Abstr.* 1966, 64, 8645 a; *J. Indian Chem. Soc.* 1965, 42, 831).

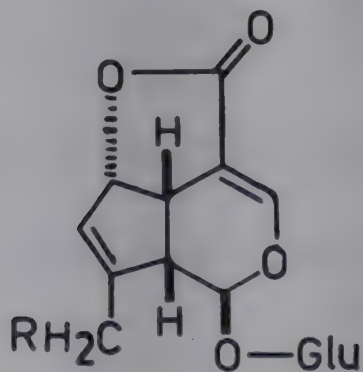
PAEDERIA (Rubiaceae)

P. foetida L.; see *P. scandens* (Lour.) Merr.

P. scandens (Lour.) Merr. syn. *P. foetida* auct. (non L.), *P. tomentosa* Blume (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 184).

Asperuloside and four new iridoid glucosides - paederoside, mp. 122°, paederosidic acid, scandoside, mp. 139° and deacetylasperuloside - isolated and characterised (*Tetrahedron Lett.* 1968, 683).

NEW COMPOUNDS

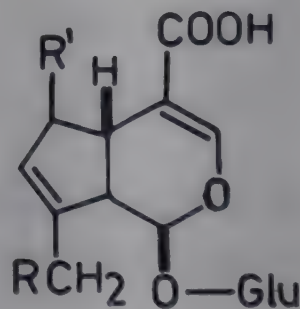


Deacetylasperuloside

R = OH

Paederoside

R = SAc



Paederosidic acid

R = SAc, R' = α -OH

Scandoside

R = OH, R' = β -OH

P. tomentosa Blume; see *P. scandens* (Lour.) Merr.

PADUS (Rosaceae)

P. cornuta (Wall. ex Royle) Carr.; see *Prunus cornuta* (Wall. ex Royle) Steud.

PAEONIA (Ranunculaceae)

P. emodi Wall. ex Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID,

New Delhi, 1956, p. 184).

Hot aqueous extract of plant had direct depressant effect on frog myocardium and direct spasmodic effect on guinea pig and rabbit ileum; cold aqueous extract reported to be devoid of any activity (*Indian J. Med. Res.* 1968, 22, 463).

Gallotannin (7.0) and glucogallin (3.6%) from petals (*Bull. Acad. Pol. Sci. Ser. Sci. Biol.* 1964, 21, 11; *Chem. Abstr.* 1964, 60, 16208 g).

PALHINHAEA (Lycopodiaceae)

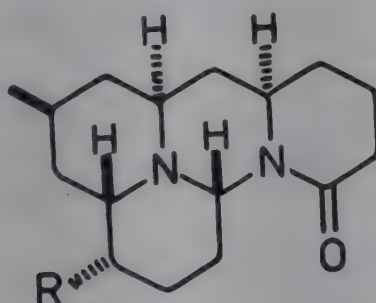
P. cernua (L.) Franco & Vasc. syn. *Lycopodium cernuum* L.

Lushai - Kangrem.

Cernuine, mp. 106° and lycocernuine, mp. 230°, isolated and structures elucidated (*Tetrahedron Lett.* 1964, 2201; *Can. J. Chem.* 1967, 45, 433).

Distribution : Throughout India in mountainous regions and in South Andaman Islands

NEW COMPOUNDS



Cernuine

R = H

Lycocernuine

R = OH

PANAX (Araliaceae)

P. ginseng C. A. Mey. syn. *Aralia quinquefolia* Decne. & Planch.

Eng. - Ginseng.

Plant extract stimulated central nervous system and respiration due to presence of panaxosides A and B; an alkaloid, niacin, pantothenic acid and steroidal hormones were isolated which are used as a tonic and rejuvenative preparation (*Am. Perfumer* 1961, 76, 29; *Chem. Abstr.* 1962, 56, 1525 b); root extract showed hypotensive action on blood pressure in rabbits (*Chem. Pharm. Bull.* 1963, 11, 1342); plant extract when administered i.v. (10-20 mg/kg) to anaesthetised dogs produced a transitory depressor followed by a slightly longer pressor response (*Jpn. J. Pharmacol.* 1964, 14, 284; *Chem. Abstr.* 1967, 67, 31166 w).

β -Sitosterol, oleanolic acid and two unknown triterpene sapogenins obtained from root extract hydrolysate (*Pharm. Ztg., Ver. Apotheker-Ztg.* 1961, 106, 1307; *Chem. Abstr.* 1965, 62, 397 f); isolation and structure of panaxadiol, mp. 250° (*Tetrahedron Lett.* 1962, 419); a crude polysaccharide from root afforded galacturonic acid, glucose, galactose and arabinose on hydrolysis (*Khim. Prir. Soedin.* 1966, 2, 299; *Chem. Abstr.* 1967, 66, 76247 u); three biologically

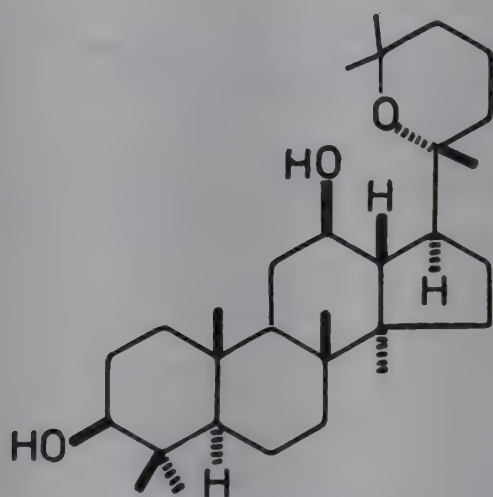
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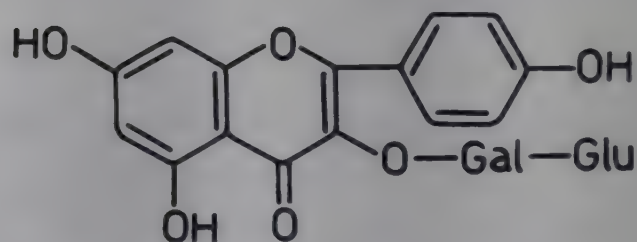
active glucosides from roots (Fr. 1,477,421 (1967) April 21; *Chem. Abstr.* 1967, 67, 102775 g); saponin - ginsenoside Rg - isolated as deca-acetate from roots (*Tetrahedron Lett.* 1968, 5449); review of separation of active glucosidic constituents and preparation of panaxosides A and B (*Pharm. Ztg.* 1968, 113, 1281; *Chem. Abstr.* 1969, 70, 6521 n); flavonoids - panasenoside, kaempferol and trifolin - from herb (*Yakugaku Zasshi* 1969, 89, 122; *Chem. Abstr.* 1969, 70, 115486 a).

Distribution : This species does not occur in India but ginseng roots are probably imported (Wealth of India VII, p. 215).

NEW COMPOUNDS



Panaxadiol



Panasenoside

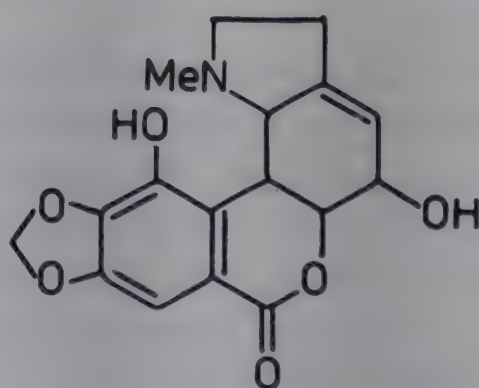
PANCRATIUM (Amaryllidaceae)

P. longiflorum Roxb.

Lycorine, mp. 272° and a new alkaloid - nor-neronine - isolated from bulbs and characterised (*Tetrahedron Lett.* 1966, 4481).

Distribution : Central India and Deccan Peninsula. Also grown in gardens.

NEW COMPOUNDS



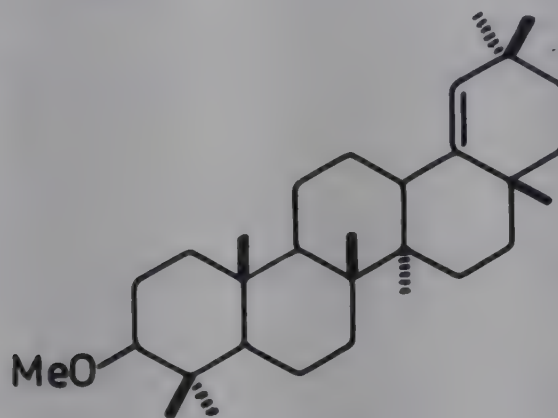
Nor-neronine

PANICUM (Poaceae)

P. miliaceum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 185).

Isolation and structure of miliacin (prosol), mp. 283° (*Nippon Kagaku Zasshi* 1961, 82, 1051; *Chem. Abstr.* 1962, 57, 13810 g; *Prikl. Biokhim. Mikrobiol.* 1965, 1, 664; *Chem. Abstr.* 1966, 64, 12749 d); hordenine from mature leaves, bark and flowers (*New Zealand J. Sci.* 1969, 12, 171; *Chem. Abstr.* 1969, 70, 90708 j).

NEW COMPOUNDS



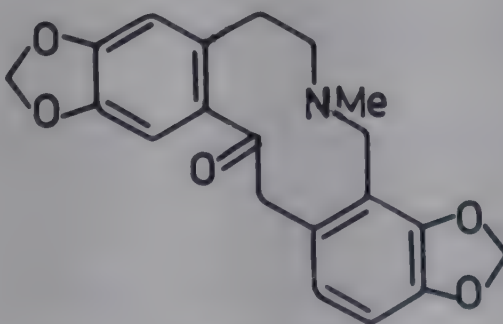
Miliacin

PAPAVER (Papaveraceae)

P. dubium L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 185).

Rhoeadine, rhoeagenin, protopine (fumarine), alkaloids Ra, mp. 159° and Ru, mp. 243°, isolated from aerial parts (*Collect. Czech. Chem. Commun.* 1962, 27, 1210).

NEW COMPOUNDS

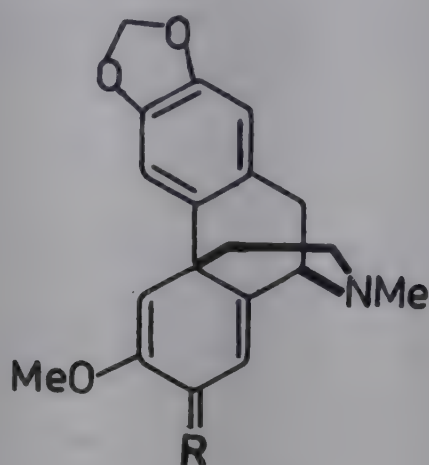


Protopine

P. nudicaule L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 185).

New alkaloids - amurine and nudaaurine, mp. 201° - present in var. *aurantiacum*; amurine, amuronine, amuroline, muramine (cryptopalmatine), mp. 176° and amurensine, mp. 213°, contained in var. *amurensis* (*Naturwiss.* 1960, 47, 180; *Chem. Abstr.* 1960, 54, 18572 i); structures of amurine and nudaaurine established (*Naturwiss.* 1965, 52, 259; *Chem. Abstr.* 1966, 64, 6705 e); amuronine characterised as 1,2-dimethoxy-8,9-dihydromecambran-10-one and amuroline as its reduction product (*Pharmazie* 1966, 21, 379; *Chem. Abstr.* 1966, 65, 17011 e); amurensine and amurensinine isolated (*Chem. Commun.* 1966, 36).

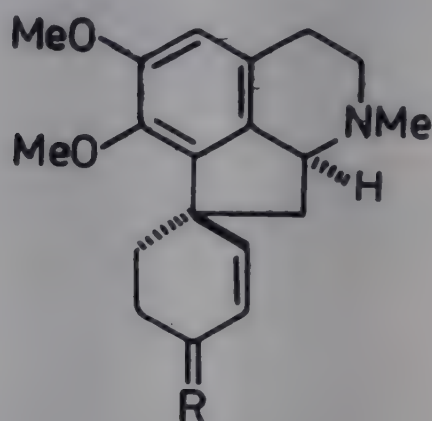
NEW COMPOUNDS



Amurine

R = O

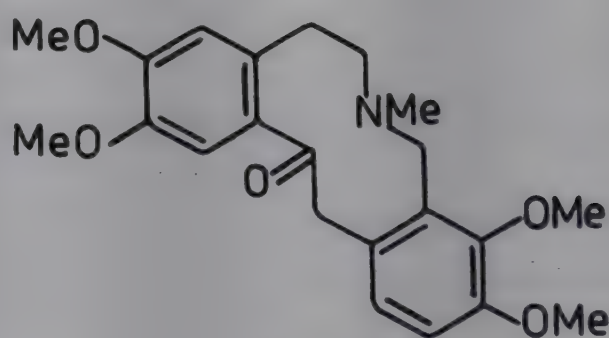
Nudaaurine

R = H, β -OH

Amuronine

R = O

Amuroline

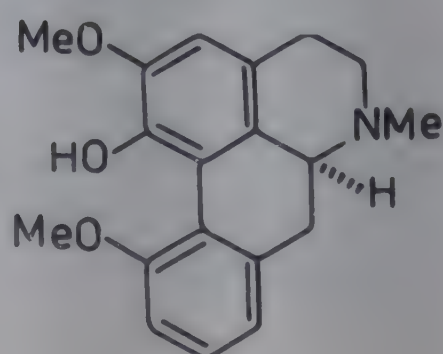
R = H, α -OH

Muramine

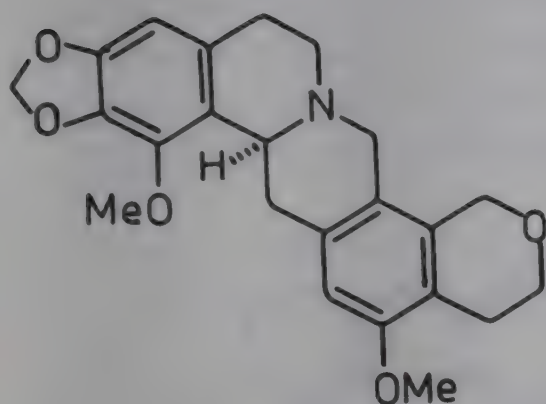
P. orientale L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 185).

Stereochemistry and synthesis of (\pm)isothebaine (*Proc. Chem. Soc.* 1964, 85; *Chem. Abstr.* 1964, 60, 13281 e; *J. Chem. Soc. C* 1965, 4550); isothebaine, 13-methyltetrahydro-protoberberine derivative and two unidentified alkaloids isolated (*Abh. Deut. Akad. Wiss. Berlin Kl. Chem. Geol. Biol.* 1966, 319; *Chem. Abstr.* 1967, 66, 105074 t); isothebaine, orientalidine, mp. 197°, nuciferine, mp. 168°, mecanbridine, mp. 178°, salutaridine, mp. 199° and oxysanguinarine, mp. 325°, isolated from plant (*Acta Univ. Palacki. Olomuc. Fac. Med.* 1966, 5; *Chem. Abstr.* 1967, 67, 54290 w); structure elucidation of orientalidine (*Collect. Czech. Chem. Commun.* 1969, 34, 875).

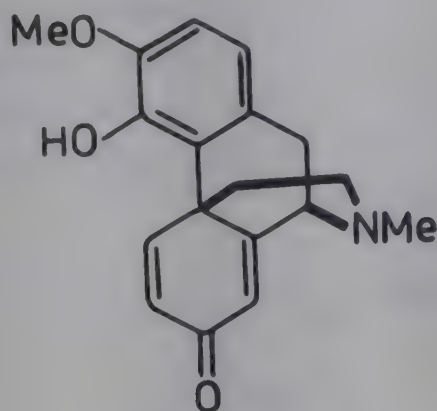
NEW COMPOUNDS



Isothebaine



Orientalidine



Salutaridine

P. rhoeas L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 185).

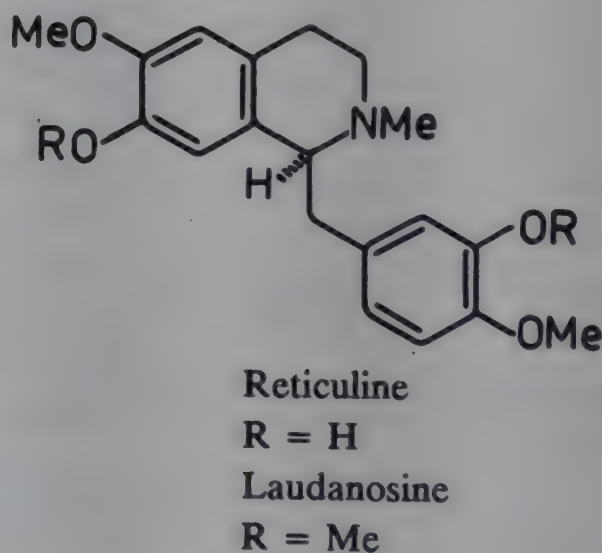
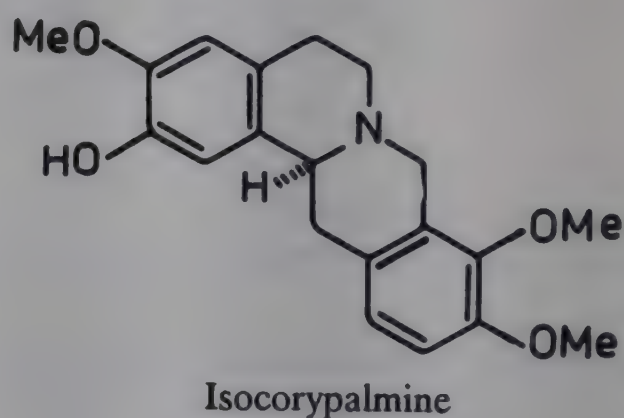
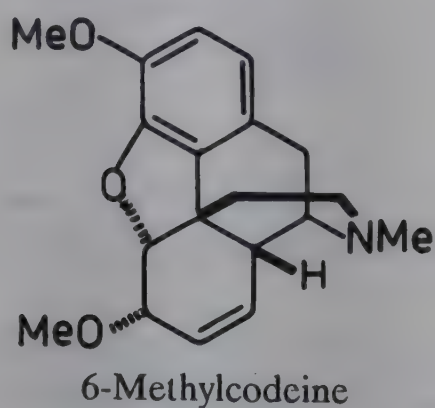
Rhoearubine (isomer of rhoeadine), mp. 165° , renamed as isorhoeadine (*Arch. Pharm.* 1961, 294, 301; *Chem. Abstr.* 1961, 55, 20330 c); rhoeadine, mp. 250° , rhoeagenin, protopine (fumarine) and alkaloids R-a, mp. 159° , R-b, mp. 200° , R-c, mp. 240° , R-d, mp. 295° , R-e, mp. 290° , R-g, mp. 145° , R-k, mp. 290° , R-m, mp. 237° , R-o, mp. 213° , R-p, mp. 300° , R-r, mp. 150° , R-s, mp. 223° , R-t, mp. 210° , R-v, mp. 113° from aerial parts (*Collect. Czech. Chem. Commun.* 1962, 27, 1210; *Czech.* 102,654 (1962) Feb. 15; *Chem. Abstr.* 1963, 58, 13731 f); (-)-sinactine, rhoeadine, rhoeagenin, isorhoeadine, protopine, glaudine, coptisine, chelerythrine, sanguinarine and papaverrubins A, mp. 223° , B, D and E, mp. 231° , isolated (*Pharmazie* 1965, 20, 394; *Chem. Abstr.* 1965, 63, 9743 f; *Arch. Pharm.* 1965, 298, 385; *Chem. Abstr.* 1965, 63, 14925 d; *Abh. Deut. Akad. Wiss. Berlin Kl. Chem. Geol. Biol.* 1966, 319; *Chem. Abstr.* 1967, 66, 105074 f); cyclolaudenol and (+)nonacosan-10-ol, mp. 81° , isolated from herb (*Diss. Pharm.* 1965, 17, 527; *Chem. Abstr.* 1966, 64, 18029 d); chemical conversion of papaverubin A to rhoeadine and isorhoeadine (*Collect. Czech. Chem. Commun.* 1967, 32, 416); (+)nonacosan-10-ol, ceryl alcohol and β -sitosterol isolated (*Rocz. Chem.* 1968, 42, 1887; *Chem. Abstr.* 1969, 70, 112404 m).

P. somniferum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 185).

Detection of morphine, thebaine, codeine, narceine, narcotine and papaverine by circular PC (*Rev. Med.* 1959, 5, 434; *Chem. Abstr.* 1960, 54, 7976 i); glucose, fructose, sucrose, sedoheptulose, mannoheptulose and a complex polysaccharide from Yugoslavian poppy capsules (*J. Pharm. Pharmacol.* 1959, 11, 689; *Chem. Abstr.* 1960, 54, 9204 g); porphyroxine, mp. 192° and a new alkaloid - somniferine, mp. 225° , isolated (*Pharmazie* 1962, 17, 692; *Chem. Abstr.* 1963, 58, 12859 c); isolation of isocorypalmine (*Pharmazie* 1966, 21, 492; *Chem. Abstr.* 1967, 66, 14007 g); absolute configuration of α -narcotine (IR:9S) (*Tetrahedron Lett.* 1963, 1857; *J. Chem. Soc. C* 1965, 1087); detection of narceine, morphine, neopine, codeine, laudanine, thebaine, laudanoline, cryptopine, protopine, nartoline, papaverine and narcotine by TLC (*Acta Pharm. Hung.* 1964, 34, 221; *Chem. Abstr.* 1964, 61, 16433 g; *Pharmazie* 1965, 20, 439; *Chem. Abstr.* 1965, 63, 9743 d); isolation of a new alkaloid - 6-methylcodeine (*J.*

Pharm. Sci. 1965, 54, 1393); isolation and characterisation of (+)laudanidine, (+)laudanosine and a new alkaloid - (+)reticuline (*Tetrahedron Lett.* 1965, 1271); presence of cystine, lysine, histidine, arginine, aspartic acid, serine, glutamic acid, valine and isoleucine in seeds (*Naturwiss.* 1965, 52, 516; *Chem. Abstr.* 1966, 64, 1012 g); isolation of isoboldine (*J. Pharm. Sci.* 1967, 56, 754); porphyroxine isolated (*J. Pharm. Sci.* 1967, 56, 1658).

NEW COMPOUNDS



BIOLOGICAL ACTIVITY

Papaverine enhanced oxygen consumption and formation of creatine phosphate during respiration in myocardial tissue of rabbits (*Uch. Zap. Inst. Farmakol. Khimioterapii, Akad. Nauk SSSR* 1960, 2, 212; *Chem. Abstr.* 1962, 57, 5272 i); rapid i.v. injection of 0.12-7.0 mg papaverine decreased arterial blood pressure for 10-20 seconds in dogs anaesthetised with pentobarbitol and caused marked increase in cardiac output at a nearly constant heart rate, probably the result of marked peripheral vasodilatation (*Arch. Int. Pharmacodyn. Ther.* 1960, 126, 386; *Chem. Abstr.* 1961, 55, 5777 b); marked spasmolytic effect was produced by papaverine and spasmaverin on corpus and isthmus of human uteri (*Colectanea Pharm. Suecica* 1962, 16, 1000; *Chem. Abstr.* 1962, 57, 10493 e); morphine at dose of 11-20 mg/kg decreased respiratory rate, respiratory minute volume, pulse rate, blood pressure and serum pH and increased serum carbon dioxide concentration in decerebrate cat. Nalorphine (5 and 10 mg/kg) produced moderate increase in respiratory rate and minute volume and modest decrease in serum carbon dioxide and blood pressure. Nalorphine administration to

decerebrate cats severely depressed by morphine, produced transient and marked increase in respiratory rate, minute volume, blood pressure and pulse rate (*J. Pharmacol. Exp. Ther.* 1962, 138, 113).

PARIS (Trilliaceae)

P. polyphylla Smith

Monoglucoside of diosgenin, mp. 274°, from roots (*Indian J. Chem.* 1966, 4, 460).

Distribution : Temperate Himalayas from Himachal Pradesh to Bhutan, alt. 1500-3000 m.

PARKINSONIA (Caesalpiniaceae)

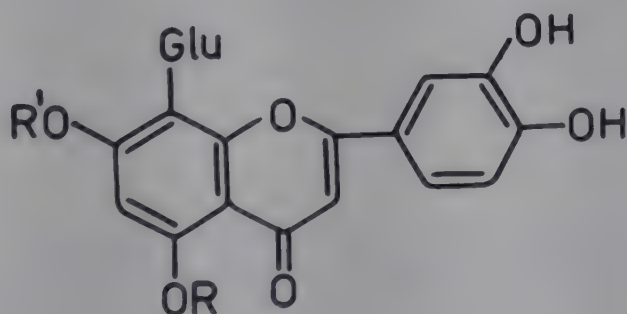
P. aculeata L.

H. - Vilayti babul, B. - Balati kikar, Mar. - Adanti, Guj. - Ram bavel; Tel. - Sima tumma.

C-Glycosides - epiorientin, parkinsonin A and parkinsonin B - isolated from leaves and flowers and characterised as 8C-luteolin glucoside, 5-O-methyluteolin-8C-β-D-glucoside and 5,7-di-O-methyluteolin-8C-β-D-glucoside respectively (*Curr. Sci.* 1965, 634; *Tetrahedron* 1966, 22, 1147; *Phytochemistry* 1967, 6, 1033).

Distribution : Native of tropical America, introduced into India and naturalised; throughout plains, planted or wild.

NEW COMPOUNDS



Epiorientin

R,R' = H

Parkinsonin A

R = Me, R' = H

Parkinsonin B

R,R' = Me

PARTHENIUM (Asteraceae)

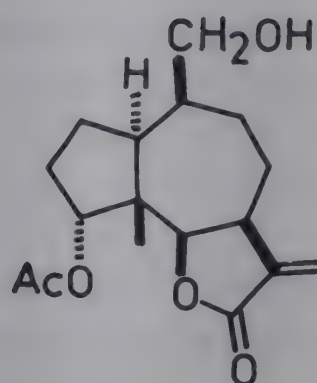
P. hysterophorus L.

Eng. - Congress grass.

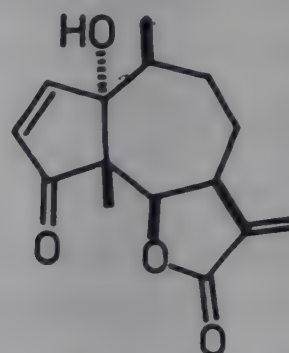
Isolation of a new guaianolide - parthenin (0.14%), mp. 163° (*J. Am. Chem. Soc.* 1959, 81, 6088; *ibid.* 1962, 84, 2601); a new sesquiterpene lactone - hysterin - together with ambrosin isolated and its structure elucidated (*J. Org. Chem.* 1966, 31, 673).

Distribution : An exotic weed, now naturalised and found throughout plains of India.

NEW COMPOUNDS



Hysterin



Parthenin

PASPALUM (Poaceae)

P. scrobiculatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 186).

Alcoholic extract of husk produced tranquillisation and tremors in various species of animals. It potentiated effect of hexobarbitone in mice, produced hypothermia in mice and rats, enhanced leptazol toxicity in rats and increased amphetamine toxicity in mice. Diminution of carotid occlusion reflex and hypotension in anaesthetised dogs, vomiting in pigeons and decrease of morphine rage in cats were observed. Oral administration of extract induced sleep and tremors in human volunteer (*British J. Pharmacol.* 1962, 18, 7).

PASTINACA (Apiaceae)

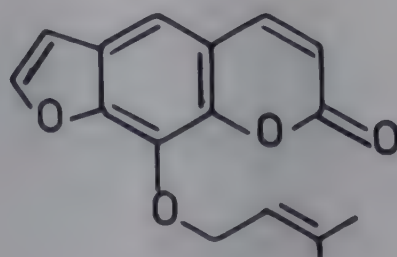
P. sativa L.

Eng. - Parsnip.

Imperatorin, bergapten, isopimpinellin, mp. 149°, xanthotoxol, mp. 240°, two new furocoumarins, mp. 145° and 140° and pastinacin, mp. 124°, from seeds (*Zh. Obshch. Khim.* 1959, 29, 3836; *Chem. Abstr.* 1960, 54, 19664 f); xanthotoxin and 9-methoxypsoralen, mp. 145°, from fruits (*Zh. Obsch. Khim.* 1961, 31, 1386; *Chem. Abstr.* 1961, 55, 23516 g); rutin, hyperin, mp. 239° and an unidentified flavone glycoside from fruits (*Dokl. Akad. Nauk SSR* 1962, 142, 1193; *Chem. Abstr.* 1962, 56, 15469 h); osthol from seeds (*Khim. Prir. Soedin.* 1967, 3, 213; *Chem. Abstr.* 1967, 67, 71103 e); quercetin-3-rhamnoglucoside, isorhamnetin-3-glucosido-7-rhamnoside, isorhamnetin-3-glucoside and quercetin-3-glucoside from flowers and plant (*Diss. Pharm. Pharmacol.* 1968, 20, 529; *Chem. Abstr.* 1969, 70, 14361 a).

Distribution : Cultivated in India.

NEW COMPOUNDS

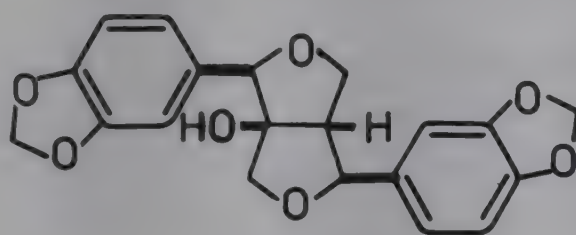


Imperatorin

PAULOWNIA (Scrophulariaceae)*P. tomentosa* Steud.

Syringin (0.3%) from trunk bark (*Yakugaku Zasshi* 1959, 79, 1226; *Chem. Abstr.* 1960, 54, 3609 a); (+)sesamin, mp. 122° and paulownin, mp. 104°, from wood; paulownin characterised as 1,4-bis(3,4-methylenedioxyphenyl)tetrahydro-1H,3H-furo[3,4-c]furan-3-ol (*Yakugaku Zasshi* 1963, 83, 1101; *Chem. Abstr.* 1964, 60, 10661 c; *Chem. Pharm. Bull.* 1966, 14, 641).

Distribution : Ornamental tree, grown in gardens in hilly regions.

NEW COMPOUNDS

Paulownin

PAVONIA (Malvaceae)

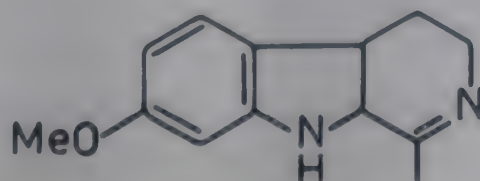
P. odorata Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 187).

β -Sitosterol, palmitic, stearic, oleic and linoleic acids from rhizomes; isovaleric acid, n-caproic acid, α -pinene and methyl heptenone from essential oil (*Indian J. Appl. Chem.* 1965, 28, 190; *Chem. Abstr.* 1967, 66, 83066 n).

PEGANUM (Rutaceae)

P. harmala L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 187).

Harmine, mp. 266°, harmaline, vasicine (peganine) and harmalol, isolated from plant (*Deut. Apoth.-Ztg.* 1960, 100, 255; *Chem. Abstr.* 1961, 55, 16913 c); harmine (0.81%), vasicine and a new alkaloid - harmidine (1.7%), mp. 257° - from seeds (*Chem. Ind.* 1962, 356; *Pakistan J. Sci. Ind. Res.* 1962, 5, 207; *Chem. Abstr.* 1963, 59, 5213 g; *Brit.* 964,690 (1964) July 22; *Chem. Abstr.* 1964, 61, 9365 h); a mixture of harmine and harmaline in stem and fruits (upto 0.8%) and in ripe seeds (3.5-4%) (*Farmatsiya* 1965, 15, 164; *Chem. Abstr.* 1965, 63, 16127 b); in addition, oxodeoxypeganine (deoxyvasicinone) and oxopeganine isolated from plant and seed (*Issled. Flory Kirgizii na Alkaloidononost. Akad. Nauk Krig. SSR Inst. Organ. Khim.* 1965, 57; *Chem. Abstr.* 1966, 64, 11550 g; *Phytochemistry* 1968, 7, 307).

NEW COMPOUNDS

Harmidine

BIOLOGICAL ACTIVITY

Harmol (2.5-5.0 mg/kg) enhanced hypertensive action of epinephrine in dog. Larger doses (10 mg/kg) altered cardiac rhythm and immediately after administration of epinephrine heart beating stopped (*C. R. Acad. Sci., Paris, Ser. D* 1963, 256, 3538; *Chem. Abstr.* 1963, 59, 5662 e).

PELTOPHORUM (Caesalpiniaceae)

P. ferrugineum (Decne.) Benth.; see *P. pterocarpum* (DC.) Backer ex Heyne

P. inerme Naves; see *P. pterocarpum* (DC.) Backer ex Heyne

P. pterocarpum (DC.) Backer ex Heyne syn. *P. ferrugineum* (Decne.) Benth., *P. inerme* Naves
Eng. - Copper pod, Rusty shield bearer; Tam. - Ivalvagai, Perungondrai; Tel. - Kondachinta.

Naringenin-7_glucoside from flowers (*J. Indian Chem. Soc.* 1969, 46, 278).

Distribution : Andaman Islands, grown in other parts of India in gardens and as avenue tree.

PENNISETUM (Poaceae)

P. americanum (L.) Leeke syn. *P. spicatum* Roem. & Schult., *P. typhoideum* Rich., *P. typhoides* (Burm.) Stapf & C. E. Hubb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 188).

Isolation of myristic, palmitic, stearic, oleic and linoleic acids by urea adduct method from seed oil (*Indian J. Agron.* 1964, 9, 288; *Chem. Abstr.* 1965, 63, 10313 h).

Note: Glossary lists *P. spicatum* and *P. typhoideum* as synonyms of *P. glaucum* R.Br., which is not correct. *P. glaucum* is a distinct species and its current valid name is *Setaria glauca* (L.) P. Beauv.

P. centuroides Rich.; see *Cenchrus ciliaris* L.

P. spicatum Roem. & Schult.; see *P. americanum* (L.) Leeke.

P. typhoides (Burm.) Stapf & C. E. Hubb.; see *P. americanum* (L.) Leeke.

P. typhoideum Rich.; see *P. americanum* (L.) Leeke.

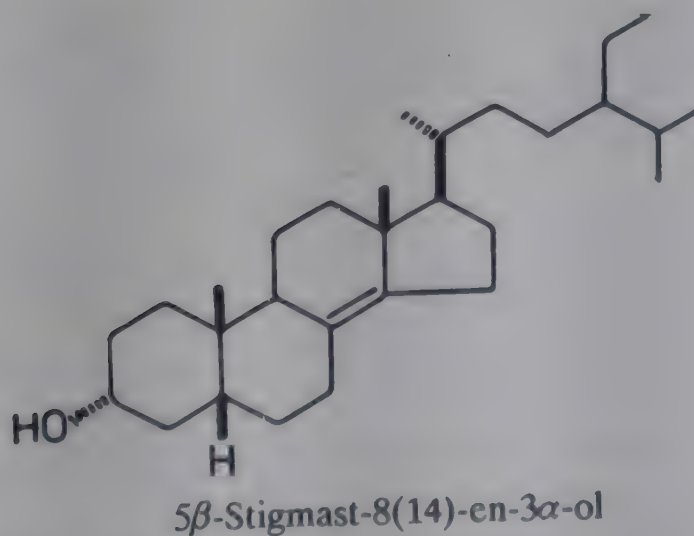
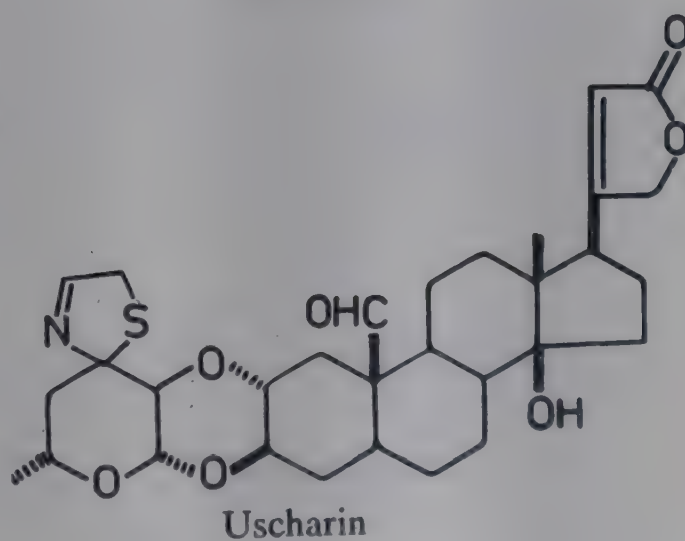
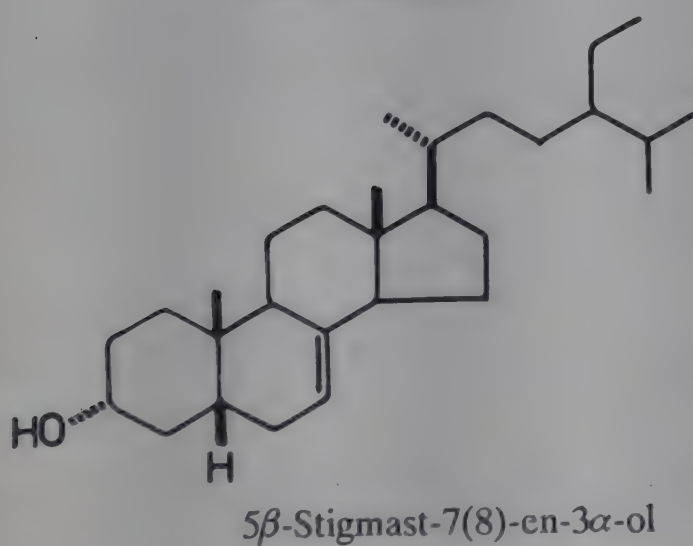
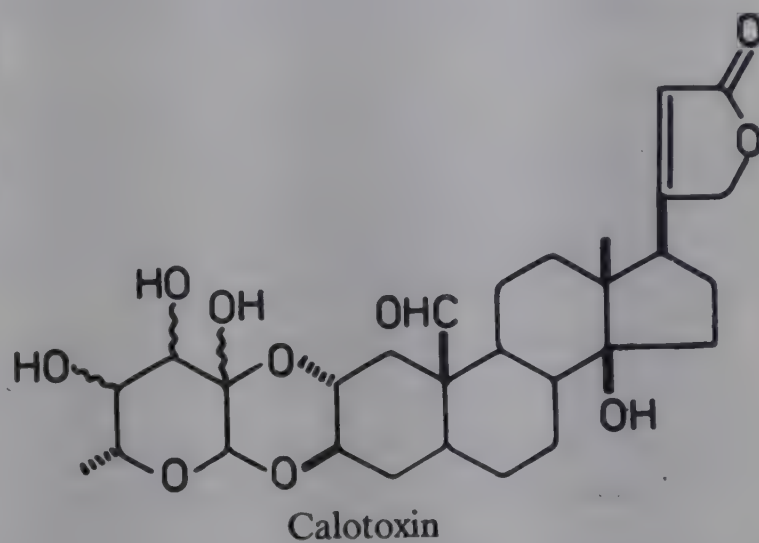
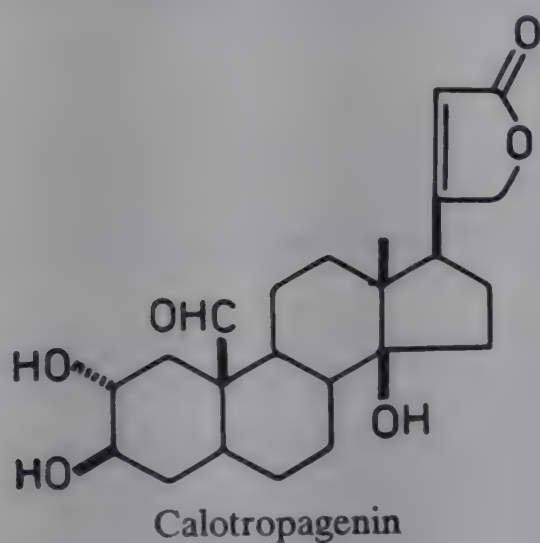
PERGULARIA (Asclepiadaceae)

P. daemia (Forsk.) Choiv. syn. *P. extensa* N. E. Br., *Daemia extensa* R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 188).

Two new sterols - 5 β -stigmast-7(8)-en-3 α -ol, mp. 183° and 5 β -stigmast-8(14)-en-3 α -ol, mp. 154°, hentriacontane, lupeol, α -amyrin, β -amyrin, β -sitosterol and betaine isolated (*J. Sci. Ind. Res.* 1959, 18B, 422); uzarigenin and a new glycoside, mp. 244°, isolated; D-cymarose, D-sarmentose, L-oleandrose and glucose obtained on hydrolysis of cardiac glycosides (*Chem. Pharm. Bull.* 1963, 11, 1452); uzarigenin and coroglaucigenin from seeds; in addition corotoxigenin, calotropagenin, dihydrocalotropagenin, calactin, calotropin, calotoxin,

uscharin, protouscharin, uscharidin and six additional compounds were detected by PC in seeds; calotropagenin was the common aglycone of all toxic glycosides (*Helv. Chim. Acta* 1962, 45, 907, 924); structures of calotropagenin, calotropin and related glycosides (*Helv. Chim. Acta* 1969, 52, 2276; *ibid.* 1970, 53, 167).

NEW COMPOUNDS



BIOLOGICAL ACTIVITY

A polypeptide fraction in doses of 1-2 mg/kg caused immediate rise of blood pressure in anaesthetised cats and dogs lasting about 10 minutes. A single dose of 4 mg/kg produced

sudden fall of blood pressure followed by death. Effect of repeated doses of 1 mg/kg polypeptide fraction on cat and dog heart was generally cardiotoxic, resulting in ventricular fibrillation and death. At 2 mg/kg, it produced variable and complex effects on respiratory system; uterus of cats, dogs, guinea pigs and rabbits showed increased tone and force of contraction both *in vivo* and *in vitro* experiments. Its LD₅₀ dose was 4-6 mg/kg in guinea pigs, rabbits, cats and dogs and 80 mg/kg in mice (*J. Sci. Ind. Res.* 1961, 20C, 51).

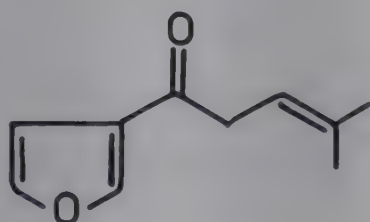
P. extensa N.E. Br.; see *P. daemia* (Forsk.) Choiv.

PERILLA (Lamiaceae)

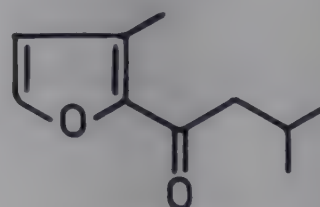
P. frutescens (L.) Britt. syn. *P. ocimoides* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 188).

Naginata ketone and elsholtzine from essential oil; structure of former revised (*Chem. Ind.* 1960, 238); a new furan ketone - β -dehydro-perilla ketone (egoma ketone) - from essential oil (*Chem. Ind.* 1962, 1618); perilla ketone, bp. 89°/5 mm. and isoegoma ketone, bp. 77°/1 mm., from seeds of var. *crispa* (*Yakugaku Zasshi* 1964, 84, 1123; *Chem. Abstr.* 1965, 62, 6336 h); α -pinene, β -pinene, limonene, p-cymene, 3-octanol, 1-octen-3-ol, β -naginatene, elsholtzia ketone and naginata ketone from essential oil of plant which seems to be hybrid of *P. frutescens* and *P. nankinensis* (*Nippon Kagaku Zasshi* 1966, 87, 1361; *Chem. Abstr.* 1967, 67, 36344 n).

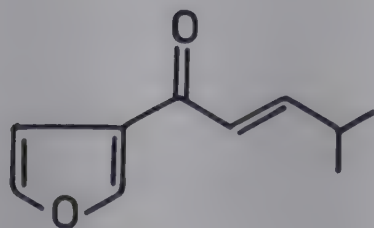
NEW COMPOUNDS



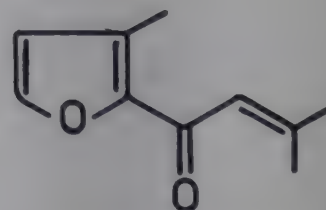
Egoma ketone



Elsholtzine



Isoegoma ketone



Naginata ketone

P. ocimoides L.; see *P. frutescens* (L.) Britt.

PEROVSKIA (Lamiaceae)

P. abrotanoides Karel. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 189).

Aromadendrene (5.5), β -cyclocitral (1.7) and a new sesquiterpene alcohol - abrotanol (2.9%) - from essential oil (*Izv. Akad. Nauk. Kaz. SSR* 1963, 3; *Chem. Abstr.* 1964, 60, 14546 d).

PERSEA (Lauraceae)

P. macrantha (Nees) Kosterm. syn. *Machilus macrantha* Nees (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 159).

Machiline HC1, mp. 248° dec., isolated (*J. Am. Pharm. Assoc. Sci. Ed.* 1960, 49, 659; *Chem. Abstr.* 1961, 55, 3008 d); macranthine and another alkaloid, mp. 207°, isolated from roots (*Indian J. Pharm.* 1968, 30, 11).

BIOLOGICAL ACTIVITY

Machiline lowered blood pressure by direct depressant effect on myocardium; it showed no antibacterial activity (*J. Am. Pharm. Assoc. Sci. Ed.* 1960, 49, 659; *Chem. Abstr.* 1961, 55, 3008 d). Alkaloid also showed direct depressant effect on frog heart muscle (*Indian J. Pharm.* 1968, 30, 11).

PETROSELINUM (Apiaceae)

P. crispum (Mill.) A. W. Hill syn. *P. sativum* Hoffm., *Apium petroselinum* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 189).

Apiole (1-allyl-2,5-dimethoxy-3,4-methylenedioxybenzene), allyltetramethoxybenzene, myristicine, a mixture of flavone glycosides and a compound, mp. 145°, from seeds (*Aptechn. Delo* 1958, 7, 27; *Chem. Abstr.* 1960, 54, 12491 d); 1-allyl-2,3,4,5-tetramethoxybenzene, apigenin-7-apioglucoside and luteolin-7-apioglucoside from fruits (*Biul. Inst. Roslin Lecznicych* 1962, 8, 98; *Chem. Abstr.* 1963, 59, 2756 g); a new synthesis of apigenin, mp. 346° (*Arch. Pharm.* 1959, 292, 792; *Chem. Abstr.* 1960, 54, 15377 c).

BIOLOGICAL ACTIVITY

Apiole exhibited significant tonic effect on uterine musculature (*Farmatsiya* 1967, 17, 39; *Chem. Abstr.* 1968, 68, 33128 e).

P. sativum Hoffm.; see *P. crispum* (Mill.) A. W. Hill.

PEUCEDANUM (Apiaceae)

P. graveolens (L.) Benth. & Hook.f.; see *Anethum graveolens* L.

P. sowa Kurz; see *Anethum graveolens* L.

PHALAENOPSIS (Orchidaceae)

P. mannii Reichb.f.

Pyrrolizidine alkaloid isolated (*Acta Chem. Scand.* 1969, 23, 1151).
Distribution : Assam, Sikkim and Nepal.

PHASEOLUS (Papilionaceae)

P. aureus Roxb.; see *Vigna radiata* (L.) Wilczek var. *radiata*

P. mungo L.; see *Vigna radiata* (L.) Wilczek var. *radiata*

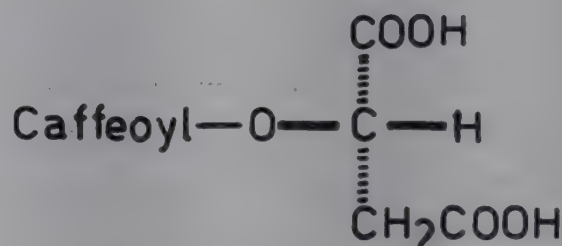
P. radiatus L. var. *aureus* (Roxb.) Prain; see *Vigna radiata* (L.) Wilczek var. *radiata*.

P. radiatus L.; see *Vigna radiata* (L.) Wilczek var. *radiata*

P. vulgaris L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 190).

Phaselic acid isolated from leaves and characterised (*Gazz. Chim. Ital.* 1960, 90, 212; *Chem. Abstr.* 1961, 55, 11354 g); determination of reduced and oxidised bound ascorbic acid in cotyledons and in radicle and plumule of seeds (*Rend. Acad. Sci. Fis. Mat.* 1961, 28, 98; *Chem. Abstr.* 1965, 62, 6803 g); TLC showed fat from beans composed of triglycerides, diglycerides, some monoglycerides, cholesterol and lecithin (*Kaseigaku Zasshi* 1965, 16, 277; *Chem. Abstr.* 1966, 64, 3960 g); sphingolipids from leaves (*J. Lipid Res.* 1969, 10, 363; *Chem. Abstr.* 1969, 71, 67931 p).

NEW COMPOUNDS



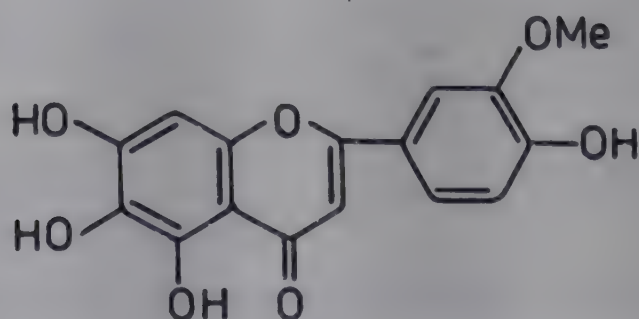
Phaselic acid

PHYLA (Verbenaceae)

P. nodiflora (L.) Greene syn. *Lippia nodiflora* Mich. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 155).

Glycosides - nodiflorin A, mp. 186°, nodiflorin B - lactose, maltose, glucose, fructose and xylose isolated (*J. Sci. Ind. Res.* 1959, 18B, 525); a new flavone - nodifloretin - characterised as 4',5,6,7-tetrahydroxy-3'-methoxyflavone (*J. Indian Chem. Soc.* 1969, 46, 271).

NEW COMPOUNDS



Nodifloretin

PHYLLANTHUS (Euphorbiaceae)

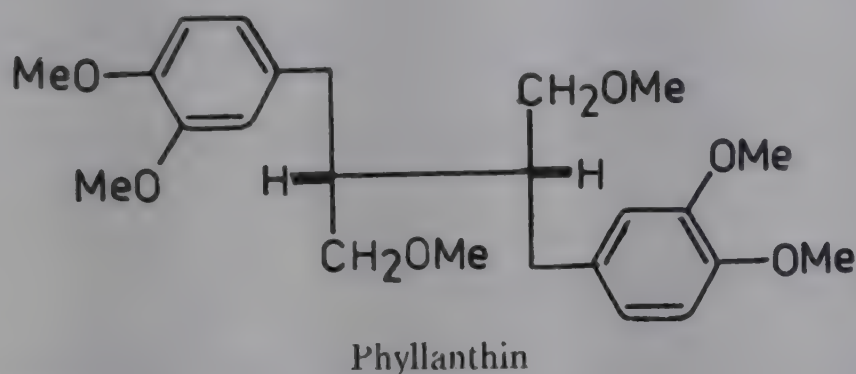
P. emblica L.; see *Emblica officinalis* Gaertn.

P. fraternus Webster syn. *P. niruri* sensu Hook.f. (non L.) (*Glossary Indian Med. Plants*,

Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 191).

Improved method of isolation of phyllanthin and hypophyllanthin from leaves; former characterised as (+)-3,3',4,4',9,9'-hexamethoxy-8,8'-butyrolignan (*Tetrahedron* 1966, 22, 2899).

NEW COMPOUNDS



P. niruri L.; see *P. fraternus* Webster

PHYSALIS (Solanaceae)

P. alkekengi L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 191).

Auroxanthin, mutatoxanthin, phydalein, zeaxanthin and its cis-isomer, β -cryptoxanthin and β -carotene from calyx (*Ann. Chem.* 1959, 626,206); glycoalkaloids detected in seeds but alkaloids were absent in fruits (*Farmatsiya* 1963, 13, 38; *Chem. Abstr.* 1964, 60, 3270 c); 3 α -tigloyloxytropene isolated from root (*Chem. Pharm. Bull.* 1965, 13, 217); physalin A, mp. 266° and physalin B isolated from var. *francheti* and their structures proposed (*Tetrahedron Lett.* 1969, 1083, 1765).

PHYSOCHLAINA (Solanaceae)

P. praealta (Walp.) Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 192).

Production of atropine and hyoscyne from plant (*J. Proc. Inst. Chemists*, Calcutta 1959, 31, 4; *Chem. Abstr.* 1960, 54, 4648 c).

PICRORHIZA (Scrophulariaceae)

P. kurrooa Royle ex Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 192).

Attempted synthesis of proposed structure of kutkin (6-O-cinnamoyl- β -D-glucosylvanilate) starting with 1,2,3,4-tetra-O-acetyl-6-tosyl glucose (*J. Sci. Ind. Res.* 1959, 18B, 522).

PIERIS (Ericaceae)

P. ovalifolia (Wall.) D. Don; see *Lyonia ovalifolia* (Wall.) Drude

PIMPINELLA (Apiaceae)

P. anisum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 193).

An aliphatic alcohol, mp. 74° , an essential oil, a fixed oil and mannitol from seeds; myricanol and mannitol from roots (*Sci. Res.* 1967, 4, 105; *Chem. Abstr.* 1968, 68, 57404 t).

P. heyneana Wall (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 193).

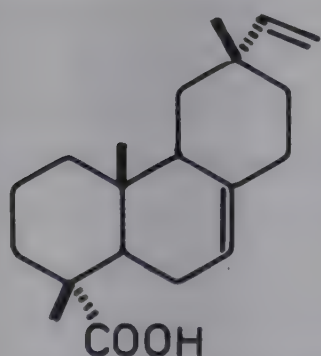
Seselin (0.5%), mp. 119° , isolated from plant (*Indian J. Chem.* 1963, 1, 279).

PINUS (Pinaceae)

P. longifolia Roxb.; see *P. roxburghii* Sargent

P. roxburghii Sargent syn. *P. longifolia* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 193).

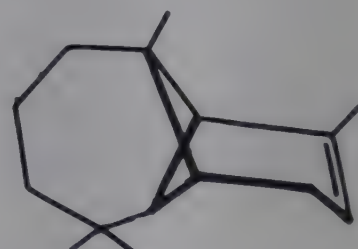
Synthesis of di-longifolene (*J. Am. Chem. Soc.* 1961, 83, 1251; *ibid.* 1964, 86, 478); structure of isopimaric acid (*J. Org. Chem.* 1962, 27, 1931); isolation of α -longipinene, bp. $102^{\circ}/10$ mm., from Swedish turpentine (*Acta Chem. Scand.* 1963, 17, 2351); longicyclene, bp. $82^{\circ}/2$ mm., isolated and structure determined (*Tetrahedron Lett.* 1963, 243).

NEW COMPOUNDS

Isopimaric acid



Longicyclene

 α -Longipinene**PIPER (Piperaceae)**

P. chaba Hunter; see *P. retrofractum* Vahl

P. cubeba L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 194).

A lignan - cubebin, mp. 133° - from fruits (*J. Indian Chem. Soc.* 1968, 45, 723).

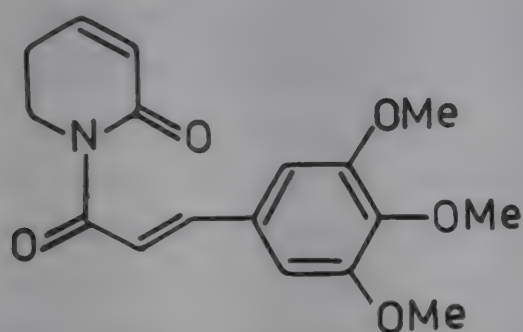
P. longum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 194).

The oil showed antibacterial activity against gram-positive and gram-negative bacteria (*Indian J. Pharm.* 1968, 30, 150).

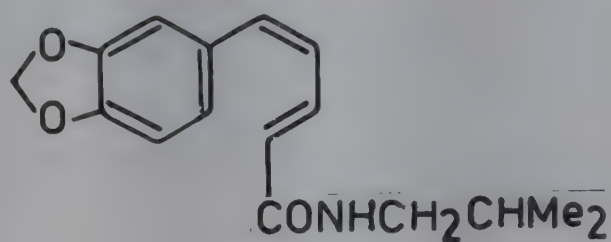
Two new monocyclic sesquiterpenes, bp. 235° (15.5) and bp. 247° (11.1%) from essential oil (*Perfumes Kosmetik* 1963, 44, 261; *Chem. Abstr.* 1965, 62, 395 g); two new alkaloids -

piperlongumine (piplartine), mp. 124° and piperlonguminine - from roots and stem bark, characterised as N-(3,4,5-trimethoxycinnamoyl)-piperidin-2-one-5-ene and isobutylamide of piperic acid respectively (*Sci. Cult.* 1963, 29, 568; *Tetrahedron Lett.* 1966, 1797; *Tetrahedron* 1967, 23, 1769; *Tetrahedron Lett.* 1968, 2395); a new sesquiterpenic hydrocarbon containing tetrasubstituted double bond from essential oil (*Riechst. Aromen Koerperpflegem.* 1966, 16, 1; *Chem. Abstr.* 1966, 64, 12455 h); sesamin isolated (*Indian J. Chem.* 1966, 4, 252); isolation of N-isobutyldeca-trans-2-trans-4-dienamide, mp. 69° (*Indian J. Chem.* 1967, 5, 588).

NEW COMPOUNDS



Piperlongumine



Piperlonguminine

BIOLOGICAL ACTIVITY

Piperlonguminine showed insecticidal activity against *Musca domestica* (*Tetrahedron Lett.* 1966, 1797).

P. nigrum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 194).

Synthesis of (-) α -cis-bergamotene and (+) β -cis-bergamotene obtained from essential oil (*J. Am. Chem. Soc.* 1969, 91, 4471).

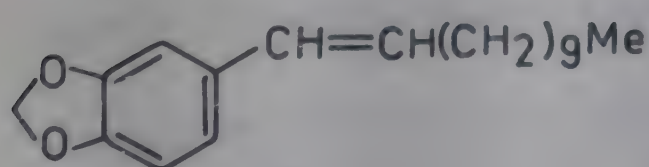
P. peepuloides Roxb.

H. - Savali peepul.

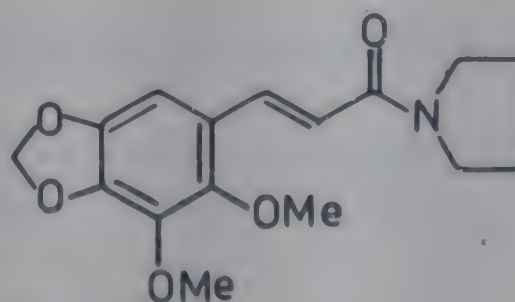
Isolation and structure determination of pipataline, mp. 37° (*Chem. Ind.* 1967, 2173); N-isobutyldeca-trans-2-trans-4-dienamide isolated (*Indian J. Chem.* 1967, 5, 588); structure of peepuloidin, mp. 149° , isolated from leaves (*Tetrahedron Lett.* 1968, 1397).

Distribution : Tropical Himalayas from Nepal to Bhutan, Assam and Khasi Hills ascending to 900 m.

NEW COMPOUNDS



Pipataline



Peepuloidin

P. retrofractum Vahl syn. *P. chaba* Hunter (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 194).

Piperine, β -sitosterol and a new alkaloid - piplartine, mp. 124° - from stems (*J. Pharm. Sci.* 1964, 53, 1423); an unidentified compound, mp. 122° , from stem; several free amino acids and monosaccharides identified by PC (*J. Proc. Inst. Chemists*, Calcutta 1964, 36, 259; *Chem. Abstr.* 1965, 62, 6802 b).

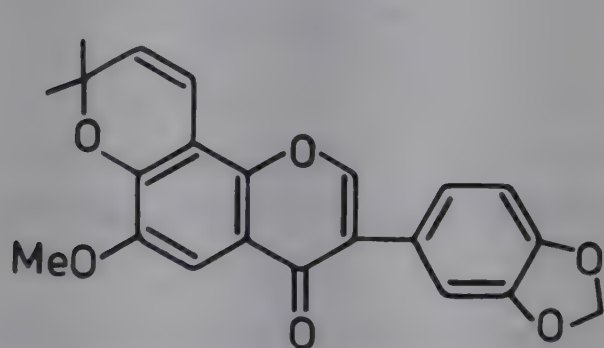
PISCIDIA (Papilionaceae)

P. erythrina L.

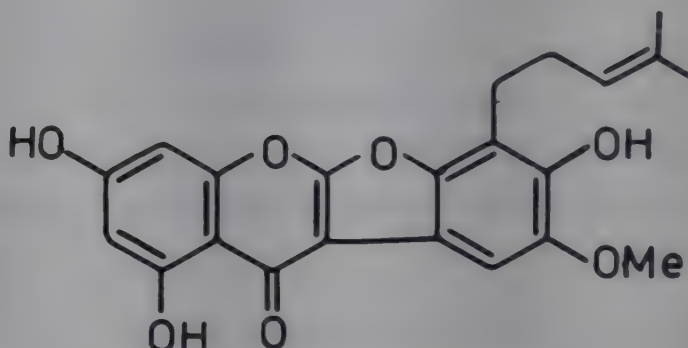
Ichthynone, mp. 202° , jamaicin, rotenone, sumatrol, three new isoflavonoids - lisetin, piscerythrone, piscidone - and three new rotenoids from roots (*Tetrahedron* 1964, 20, 1317; *Tetrahedron Suppl.* No. 7, 1966, 333).

Distribution : Grown in Indian Botanic Gardens, Howrah.

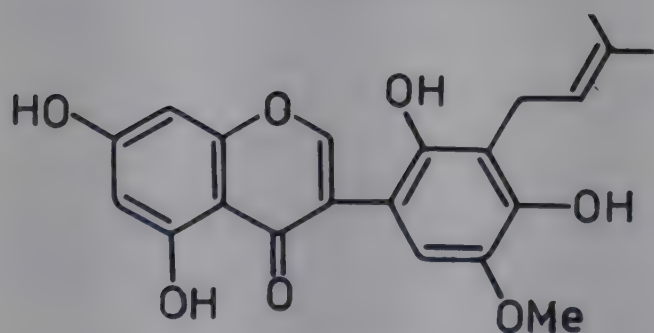
NEW COMPOUNDS



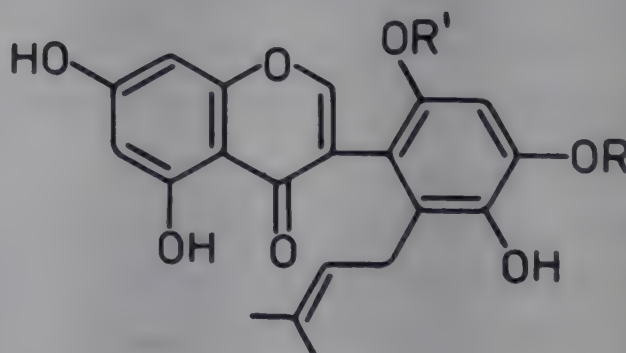
Ichthynone



Lisetin



Piscerythrone



Piscidone

R = H/Me, R' = Me/H

PISTACIA (Anacardiaceae)

P. terebinthus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 195).

Percentages of fatty acids in oils from inner and outer parts of seeds were: stearic (5.4, 4.2), palmitic (14.2, 21.5), oleic (41.5, 45.7), palmitoleic (14.3, 18.0) and linoleic (24.5, 8.6%) (*Istanbul Univ. Fen. Fak. Mecmuasi*, Ser. C 1964, 29, 141; *Chem. Abstr.* 1965, 63, 922 g); aliphatic hydrocarbon, esters, triterpenic alcohols, sterols and polyisoprenoid alcohols from

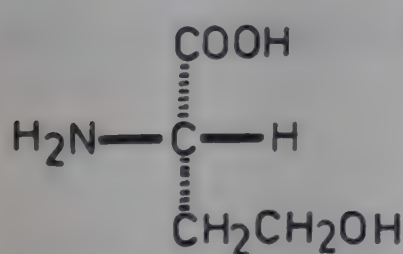
leaves (*Phytochemistry* 1967, 6, 597; *Bull. Soc. Chim. Fr.* 1966, 493).

PISUM (Papilionaceae)

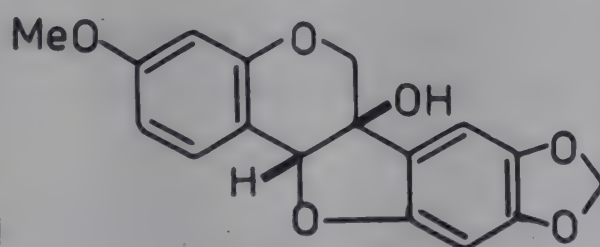
P. sativum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 195).

Pisatin from pods characterised as 3-hydroxypterocarpin (*J. Am. Chem. Soc.* 1962, 84, 1919); kaempferol-3-triglucoside, quercetin-3-triglucoside and their p-coumaric acid esters from leaf, petiole, tendril and stem (*Phytochemistry* 1965, 4, 285); isolation of some pyrimidine derivatives and amino acids from seedlings (*Arch. Int. Physiol. Biochem.* 1965, 73, 529; *Chem. Abstr.* 1967, 67, 747 g); L-pipecolic acid isolated from legumes (*Meiji Daigaku Nogakubu Kenkyu Hokoku* No. 19, 1966, 79; *Chem. Abstr.* 1967, 66, 83079 u); detection of free homoserine in seeds and pods by PC (*Pr. Zakresu Towarozn. Chem. Wyzsza Szk. Ekon. Poznaniu Zesz. Nauk.* Ser. 1, No. 26, 1966, 113; *Chem. Abstr.* 1967, 66, 52935 r); methyl-4-chloroindole-3-acetate, mp. 120°, from immature seeds (*C. R. Acad. Sci. Paris, Ser. D* 1967, 265, 1795; *Chem. Abstr.* 1968, 68, 57365 t; *Nature* 1968, 219, 959); isolation and characterisation of a new glycoside - pisatoside, mp. 104° (*Arch. Biochem. Biophys.* 1967, 121, 531; *Chem. Abstr.* 1968, 68, 59838 m); absolute configuration of homoserine (*Chem. Lett.* 1973, 5).

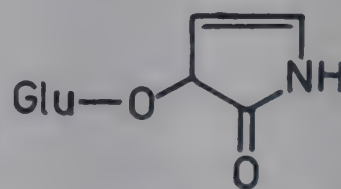
NEW COMPOUNDS



Homoserine



Pisatin



Pisatoside

PITHECELLOBIUM (Mimosaceae)

P. dulce (Roxb.) Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 196).

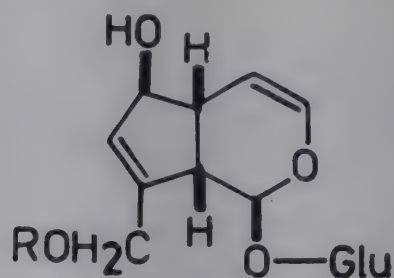
A saponin, mp. 175°, a sapogenin - pithogenin, mp. 207° - a sterol glucoside B, mp. 278° and a flavone, mp. 298°, isolated from seeds; hexacosanol, sterol glucoside A, mp. 282°, proline, leucine, valine, asparagine and glucose from mesocarp (*J. Pharm. Sci.* 1963, 52, 459); α -spinasterol glucoside, mp. 292°, from bark (*Indian J. Chem.* 1967, 5, 395).

PLANTAGO (Plantaginaceae)

P. lanceolata L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 196).

Agnuside, mp. 145° and aucubin, mp. 182°, from leaves; former characterised as p-hydroxybenzoate of aucubin (*Arch. Pharm.* 1960, 293, 556; *Chem. Abstr.* 1960, 54, 20084 f).

NEW COMPOUNDS



Aucubin

R = H

Agnuside

R = COC₆H₄OH(p)**PLECTRANTHUS** (Lamiaceae)*P. incanus* Link.; see *P. mollis* (Ait.) Spreng.*P. mollis* (Ait.) Spreng. syn. *P. incanus* Link

Antimicrobial activity of essential oil determined against nine pathogenic bacteria; activity of 10 mg of essential oil against *Staphylococcus aureus* was the same as that of 10 units of penicillin (*Indian J. Pharm.* 1963, 25, 189).

Distribution : Himalayas from Himachal Pradesh to Sikkim, ascending upto 2000 m, Khasi Hills, hills of central India and Western Ghats.

PLUCHEA (Asteraceae)

P. lanceolata (DC.) Clarke (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 197).

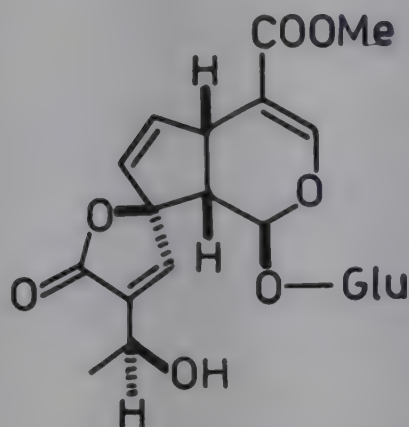
Plant contained glycosides and sterol but no alkaloid was detected. Plant extract showed acetylcholine-like action, spasmolytic action on different smooth muscle preparations and potentiated barbiturate hypnosis (*Indian J. Med. Res.* 1965, 53, 1062).

PLUMERIA (Apocynaceae)*P. acuminata* Ait.; see *P. rubra* L. forma *acuminata* (Ait.) Sant. & Irani ex Shah*P. acutifolia* Poir.; see *P. rubra* L. forma *acuminata* (Ait.) Sant. & Irani ex Shah

P. alba L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 198).

α - and β -Amyrin acetates, β -sitosterol, plumieride, mp. 219° and scopoletin from bark (*Proc. Indian Acad. Sci.* 1960, 52, 173; *Chem. Abstr.* 1961, 55, 8457 b); structure of plumieride (*Helv. Chim. Acta* 1961, 44, 1447).

NEW COMPOUNDS

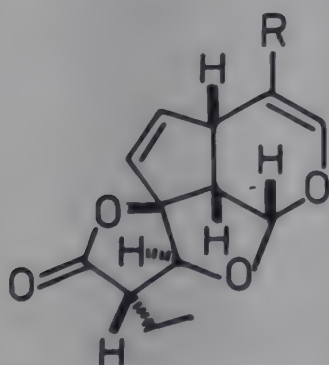


Plumieride

P. rubra L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 198).

Fulvoplumierin, mp. 147° , plumericin, mp. 211° and three new compounds - isoplumericin, mp. 200° , β -dihydroplumericin, mp. 191° and β -dihydroplumericinic acid, mp. 189° - from roots (*Helv. Chim. Acta* 1961, 44, 1447); fulvopulmierin, β -sitosterol, lupeol and plumieride from stem bark (*Indian J. Pharm.* 1967, 29, 273); structure of fulvoplumierin (*Helv. Chim. Acta* 1962, 45, 1406).

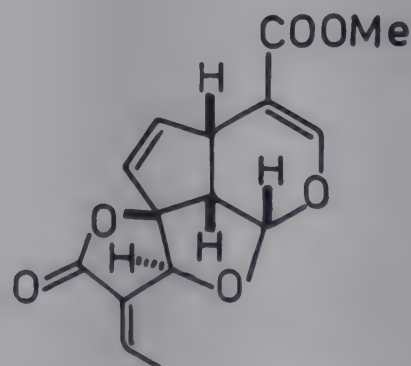
NEW COMPOUNDS

 β -Dihydroplumericinic acid

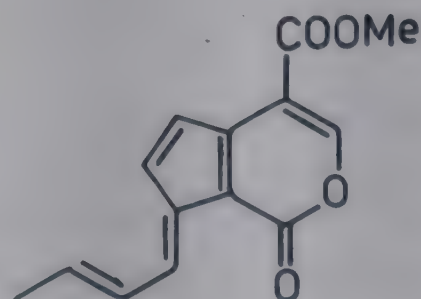
R = COOH

β -Dihydroplumericin

R = COOMe



Isoplumericin



Fulvoplumierin

P. rubra L. forma *acuminata* (Ait.) Sant. & Irani ex Shah syn. *P. rubra* L. var. *acutifolia* Bailey, *P. acuminata* Ait., *P. acutifolia* Poir. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 198).

Fulvoplumierin, α -amyrin and plumieride from bark (*Indian J. Pharm.* 1961, 23, 122).

P. rubra L. var. *acutifolia* Bailey; see *P. rubra* L. forma *acuminata* (Ait.) Sant. & Irani ex Shah

PODOPHYLLUM (Podophyllaceae)

P. emodi Wall. ex Hook.f. & Th.; see *P. hexandrum* Royle

P. hexandrum Royle syn. *P. emodi* Wall. ex Hook.f. & Th. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 189).

Astragalin (kaempferol-3-glucoside) isolated (*Experientia* 1965, 21, 67).

POGOSTEMON (Lamiaceae)

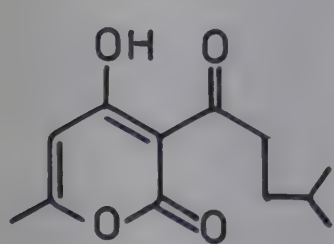
P. benghalense (Burm.f.) O. Kuntze syn. *P. plectranthoides* Desf. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 198).

α -Terpinene, 1-caryophyllene, 1-cadinene, S-guaiazulene from essential oil of leaves (*Bull. Nat. Inst. Sci. India* No. 37, 1968, 197; *Chem. Abstr.* 1969, 71, 53455 z).

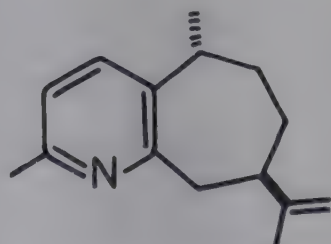
P. heyneanus Benth. syn. *P. patchouli* Hook.f. (non Pelle) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi 1956, p. 198).

Isolation and characterisation of two new alkaloids - patchoulipyridine and epiguaipyridine - from essential oil (*J. Am. Chem. Soc.* 1966, 88, 3109); isolation, structure and synthesis of dhelwangin, mp. 41°, from essential oil (*Tetrahedron Lett.* 1969, 2279); a new tricyclic sesquiterpene - seychellene - from oil (*Tetrahedron* 1969, 25, 4903).

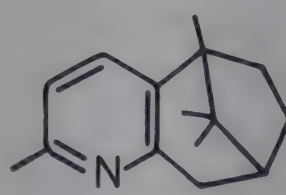
NEW COMPOUNDS



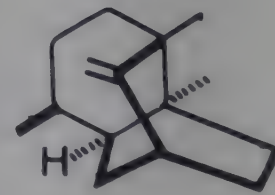
Dhelwangin



Epiguaipyridine



Patchoulipyridine



Seychellene

P. patchouli Hook.f.; see *P. heyneanus* Benth.

P. plectranthoides Desf.; see *P. benghalense* (Burm.f.) O. Kuntze

POINCIANA (Caesalpinaceae)

P. elata L.; see *Delonix elata* (L.) Gamble

P. pulcherrima L.; see *Caesalpinia pulcherrima* (L.) Swartz.

P. regia Boj. ex Hook.; see *Delonix regia* (Boj. ex Hook.) Rafin.

POLEMONIUM (Polemoniaceae)

P. coeruleum L.

Three saponins isolated and hydrolysed to yield galactose and arabinose (*Acta Pol. Pharm.*

1968, 25, 463; *Chem. Abstr.* 1969, 70, 88197 y).

Distribution : Alpine western Himalayas, alt. 3000-4000 m.

POLYALTHIA (Annonaceae)

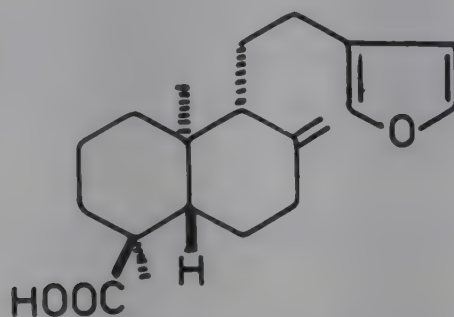
P. fragrans (Dalz.) Bedd.

Tam. - Nadunar; Kan. - Gauri, Habbe.

Structure elucidation of a new diterpene acid - polyalthic acid, mp. 102° - from bark (*Helv. Chim. Acta* 1961, 44, 1040).

Distribution : Evergreen forests of Western Ghats from Konkan southwards upto 1200 m.

NEW COMPOUNDS



Polyalthic acid

POLYGONATUM (Liliaceae)

P. verticillatum (L.) Allioni

Isolation of lysine, serine, aspartic acid and threonine (*Indian J. Pharm.* 1969, 31, 31).

Distribution : Himalayas from Kashmir to Sikkim, alt. 2000-4200 m.

POLYGONUM (Polygonaceae)

P. aplanum All.

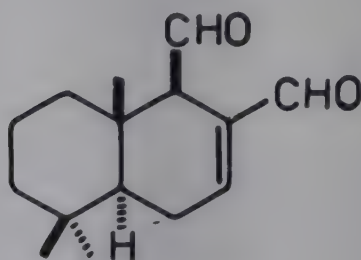
Myricetin, quercetin and kaempferol isolated (*Polez. Rast. Prir. Flory Sib.* 1967, 146; *Chem. Abstr.* 1968, 69, 103814 x).

Distribution : North-western Himalayas from Kashmir to Kumaon, alt. 2100-3600 m.

P. hydropiper L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 200).

Flavanol glycoside content increases till first fruits begin to ripen and then decreases; maximum content (9%) found in leaves of young plants (*Ziva* 1959, 7, 125; *Chem. Abstr.* 1960, 54, 3849 h); a new sesquiterpene dialdehyde - polygodial (tadeonal) (0.05%), mp. 57° - characterised as drim-7-en-11,12-dial (*Aust. J. Chem.* 1962, 15, 322); structures of tadeonal and isotadeonal (C-9 isomer) determined (*Nippon Kagaku Zasshi* 1963, 84, 748; *Chem. Abstr.* 1964, 60, 13277 f).

NEW COMPOUNDS



Polygodial

P. orientale L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 200).

Orientoside shown to be identical with vitexin and orientin with luteolin analog of vitexin (*Arch. Pharm.* 1959, 292, 380; *Chem. Abstr.* 1960, 54, 5010 f); β -sitosterol and an unidentified compound, mp. 69° , isolated (*Bull. Inst. Chem., Acad Sinica* No. 15, 1968, 33; *Chem. Abstr.* 1969, 70, 54816 j).

P. persicaria L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 200).

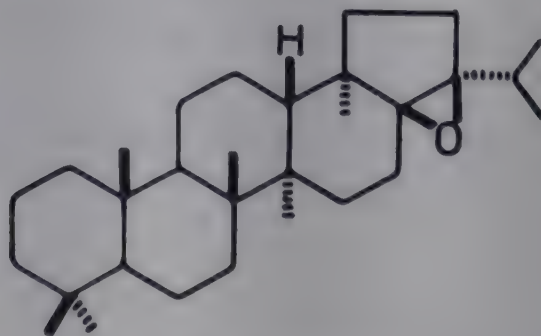
Quercetin, isoquercetin and hyperoside (hyperin) from leaves (*Khim. Prir. Soedin.* 1968, 4, 131; *Chem. Abstr.* 1968, 69, 41745 q).

POLYPODIUM (Polypodiaceae)

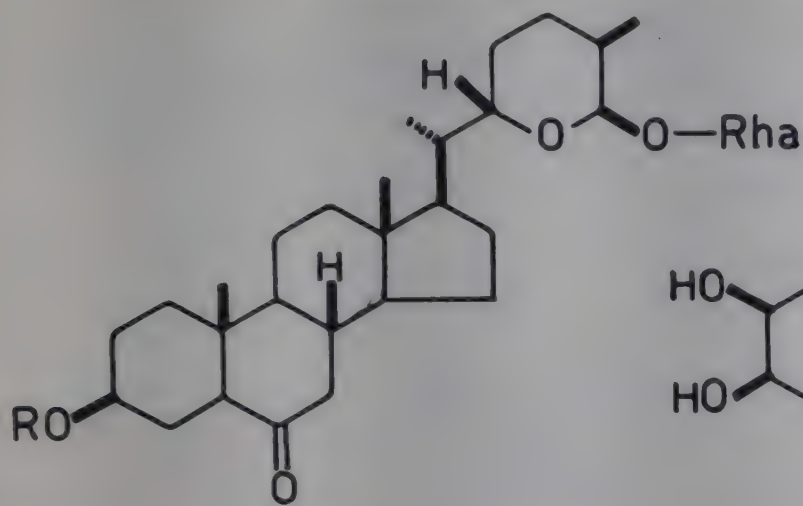
P. vulgare L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 201).

Cyclolanostanic triterpenes - cyclolaudenol, mp. 123° and its 4-methyl homolog, mp. 139° - from roots (*Bull. Soc. Chim. Fr.* 1964, 2359); 9(11)-fernene, 22-hopene and a new compound, mp. 268° , characterised as 17,21-epoxyhopane, isolated from rhizomes (*Tetrahedron Lett.* 1966, 979; *Chem. Commun.* 1967, 507); polypodine A (ecdysterone), mp. 150° , polypodine B (5β -hydroxyecdysterone), mp. 244° , glucocaffeic acid, mp. 133° , polydine, mp. 191° , osladine, mp. 201° , samambaine, mp. 251° and two saponins, mp. 199° and 213° , from rhizomes (*Collect. Czech. Chem. Commun.* 1967, 32, 2867; *Tetrahedron Lett.* 1967, 5139; *ibid.* 1968, 6063); chemical studies on minor constituent, hopene-1 oxide (17,21-epoxyhopane) (*Tetrahedron Lett.* 1968, 529).

NEW COMPOUNDS

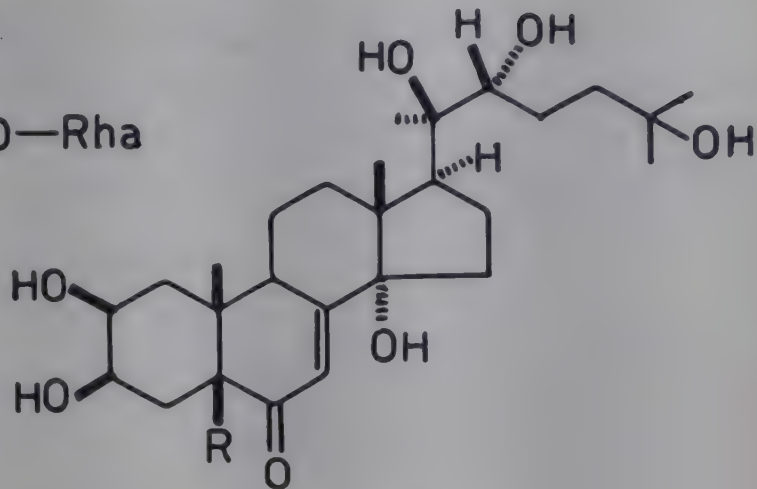


17,21-Epoxyhopane



Osladin

R = Glu(2→1)Rha



Polypodine A

R = H

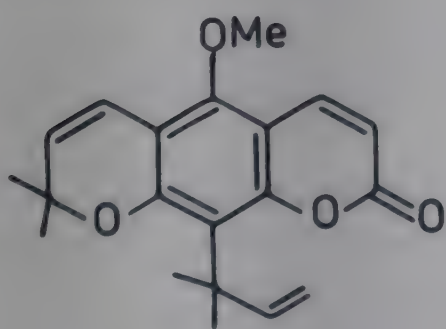
Polypodine B

R = OH

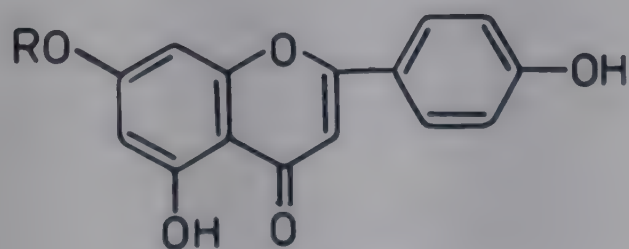
PONCIRUS (Rutaceae)*P. trifoliata* (L.) Rafin.

Flavonoid glycosides - poncirin, neoponcirin, mp. 175°, naringin, mp. 80° and rhoifolin, mp. 208° - from leaves (*Bot. Mag.* 1966, 79, 602; *Chem. Abstr.* 1969, 67, 91086 e); besides seselin, marmesin, β -sitosterol and a new compound - limonin, mp. 271° - isolated from roots (*Chem. Pharm. Bull.* 1967, 17, 1723); a new coumarin - poncitrin, mp 93° - isolated and structure elucidated (*Chem. Commun.* 1969, 168; *Tetrahedron* 1974, 30, 939).

Distribution : Native of China and Japan, introduced into India.

NEW COMPOUNDS

Poncitrin



Rhoifolin

R = Glu(2→1)Rha

PONGAMIA (Papilionaceae)

P. glabra Vent.; see *Derris indica* (Lamk.) Bennet

P. pinnata (L.) Pierre; see *Derris indica* (Lamk.) Bennet

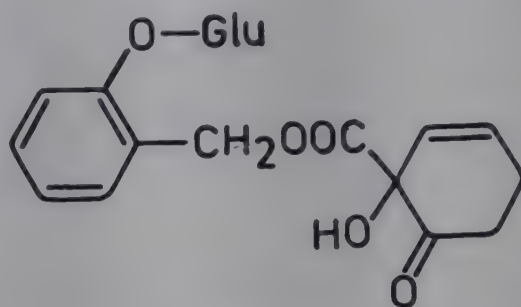
POPULUS (Salicaceae)

P. nigra L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956,

p. 201).

In addition to salicin and salicortin, a new phenol glycoside - nigracin, mp. 202° - isolated from bark and leaves (*Pharmazie* 1967, 22, 59; *Chem. Abstr.* 1967, 67, 117194 r); structure of salicortin (*Phytochemistry* 1971, 10, 3161).

NEW COMPOUNDS



Salicortin

PORTULACA (Portulacaceae)

P. oleracea L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 202).

Detection of noradrenaline, 4-(2-aminoethyl)pyrocatechol, 3-(3,4-dihydroxyphenyl) alanine and catechol by PC (*Nature* 1961, 191, 1108).

POTENTILLA (Rosaceae)

P. reptans L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 202).

Quercetin (0.29) and kaempferol (0.38%) from acid hydrolysate of extractive of leaves (*Chem. Ind.* 1960, 1132).

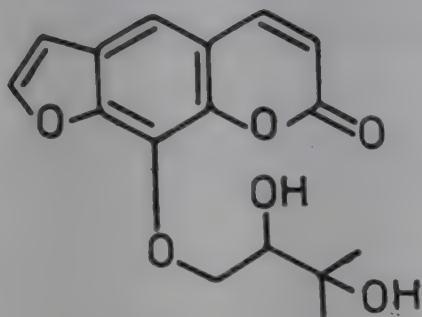
PRANGOS (Umbelliferae)

P. pabularia Lindl. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 203).

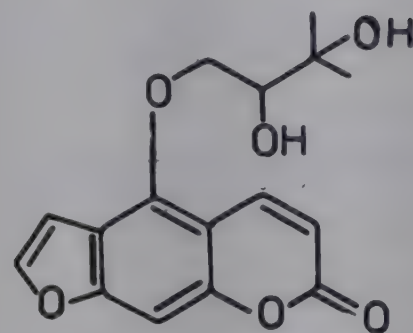
Prangenin [(S)heraclenin], mp. 114°, from roots identical with epoxyimperatorin; heraclenin obtained from seeds (*Zh. Obshch. Khim.* 1961, 31, 323; *Chem. Abstr.* 1961, 55, 22281 i; *Zh. Obshch. Khim.* 1965, 35, 403; *Chem. Abstr.* 1965, 62, 15072 a; *Khim. Prir. Soedin.* 1967, 3, 70; *Chem. Abstr.* 1967, 67, 769 r); osthol, oxypeucedanin [(R)prangolarin], peucedanin, two furocoumarins - aviprin, mp. 135°, komalin, mp. 129° - isoimperatorin, bergapten, heraclenin, pabulin and prangolarin from roots, umbels and seeds (*Indian J. Chem.* 1964, 2, 464; *Dokl. Akad. Nauk Uz. SSR* 1965, 22, 39; *Chem. Abstr.* 1965, 63, 3309 g; *Tr. Bot. Inst. Akad. Nauk SSSR Ser. 5*, Rast. Syr'e No. 12, 1965, 49; *Chem. Abstr.* 1966, 64, 5450 b); behenic, arachidic, stearic, palmitic, linoleic, oleic and petroselenic acids from saponifiable and β-carotene, a coumarin derivative and some pigments from non-saponifiable part of seed oil (*Khim. Prir. Soedin.* 1965, 1, 202; *Chem. Abstr.* 1965, 63, 15113 g); structure of alkaloid - prangosine, mp. 131° - from seeds elucidated (*Khim. Prir. Soedin.* 1967, 3, 117; *Chem. Abstr.*

1967, 67, 52284 x).

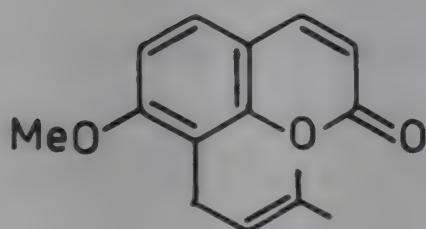
NEW COMPOUNDS



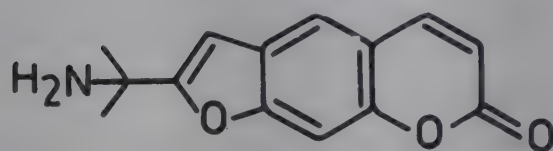
Heraclenin hydrate



Oxypeucedanin hydrate



Osthol



Prangosine

BIOLOGICAL ACTIVITY

Osthol raised blood pressure and stimulated respiration. It caused stimulation of cardiac muscle and constriction of peripheral blood vessels. It antagonised to some extent action of respiratory depressants such as phenobarbital, pentobarbital and morphine. It inhibited activity of smooth muscles of intestine and uterus and showed antagonism to acetylcholine and histamine. In normal dogs and rabbits, toxic doses caused convulsions, vomiting and stimulation of respiration (*Arch. Int. Pharmacodyn. Ther.* 1962, 138, 400; *Chem. Abstr.* 1963, 58, 845 h). Osthol showed analeptic action on respiration and heart, stimulated brain functions and had antiacetylcholine and antihistaminic actions (*Corriere Farm.* 1966, 21, 440; *Chem. Abstr.* 1967, 67, 41005 g).

PREMNA (Verbenaceae)

P. corymbosa Rottl. & Willd.; see *P. integrifolia* L.

P. integrifolia L. syn. *P. corymbosa* sensu Hook.f. (non Rottl. & Willd.), *P. obtusifolia* R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 203).

A compound, mp. 155°, isolated from root bark, was active only against gram-positive organisms (*Naturwiss.* 1964, 51, 484; *Chem. Abstr.* 1965, 62, 10823 g).

P. obtusifolia R. Br.; see *P. integrifolia* L.

PRIMULA (Primulaceae)

P. sinensis Sabine ex Lindl.

Eng. - Chinese primrose.

Fifteen 3-glucosides, 3-glucosylglucosides or 3-glucosyl-glucosylglucosides derived from six

anthocyanidins; five flavonoids - quercetin, myricetin-3-glucoside, 3-glucosylglucoside and 3-glucosylglucosylglucoside of kaempferol and sinesin an uncommon pigment shown to be dihydrokaempferol-7-glucoside - identified in flowers and leaves (*Biochem. J.* 1961, 78, 298).
Distribution : Native of China. Cultivated as ornamental in hill gardens of India.

P. vulgaris Huds.

Quercetagetin-3-gentiotrioside isolated from flowers (*Phytochemistry* 1965, 4, 647).

Distribution : Grown in gardens.

PROSOPIS (Mimosaceae)

P. cineraria (L.) Druce syn. *P. spicigera* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 204).

Patulitrin, a glucoside of patuletin, isolated from flowers (*Indian J. Chem.* 1964, 2, 83).

P. glandulosa Torr.

Prosopol, mp. 83°, prosopenol, mp. 245°, and β -sitosterol from aerial parts (*Pakistan J. Sci. Ind. Res.* 1968, 11, 1; *Chem. Abstr.* 1968, 69, 49794 a).

Distribution : Native of southern United States and northern Mexico, introduced into India and naturalised in Punjab and Rajasthan.

P. spicigera L.; see *P. cineraria* (L.) Druce.

PRUNUS (Rosaceae)

P. armeniaca L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 204).

Quercetin-3-rhamnoglucoside isolated from leaves (*C.R. Acad. Sci. Paris*, Ser. D 1959, 249, 2423; *Chem. Abstr.* 1960, 54, 13278 b); kaempferol (0.13%) from leaves (*C.R. Acad. Sci. Paris*, Ser. D 1959, 249, 2866; *Chem. Abstr.* 1960, 54, 13282 e); gum composed of xylose, arabinose and galactose in molar ratio 1:8:8 in addition to mannose, glucuronic acid and 4-O-methylglucuronic acid (*Collect. Czech. Chem. Commun.* 1965, 30, 3501).

P. avium L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 204).

Extract of stalks at 50 μ g/ml inhibited contraction of rat ileum but 500 μ g/ml caused contraction of guinea pig intestine (*Acta Physiol.* 1969, 35, 183; *Chem. Abstr.* 1969, 71, 79395 e).

Cardiovascular and circulatory effects of stalk extract were studied in frog, cat, dog and rat. Extract at 20-500 μ g/ml did not increase diameter of blood vessels but counteracted adrenaline-induced vasoconstriction in hind limbs of frogs; 50-100 μ g/ml increased amplitude of cat papillary muscle by 30% but 1-2 mg/ml decreased it by 50%, while 50 μ g/ml increased positive effect of adrenaline on the muscle and augmented contractions by 3 to 4 times; 50-100 μ g/ml administered into venous reservoir increased efficacy of barbiturate-weakened or

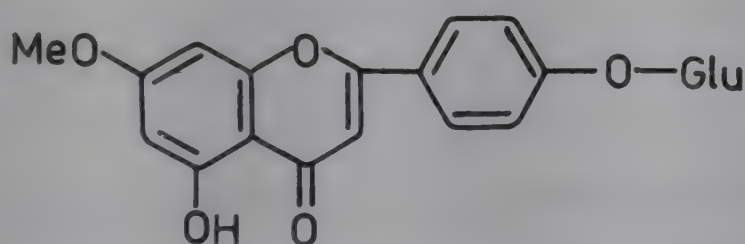
spontaneously failing heart and lung of cat; 0.5 mg/kg injected in femoral vein increased coronary blood flow in open-chest dog and decreased coronary resistance by 50% (*Acta Physiol.* 1969, 35, 189; *Chem. Abstr.* 1969, 71, 79441 s).

Kaempferol (1.26%) from leaves (*C.R. Acad. Sci. Paris*, Ser D 1959, 249, 2866; *Chem. Abstr.* 1960, 54, 13282 e); rutoside and quercetin-3-rhamnoglucoside identified in leaves (*C.R. Acad. Sci. Paris* Ser. D 1959, 249, 2423; *Chem. Abstr.* 1960, 54, 13278 b); an acidic polysaccharide composed of glucuronic acid, 4-O-methyl-glucuronic acid, galactose, mannose, arabinose and xylose isolated from gum of var. *duracina* (*Chem. Zvesti* 1968, 22, 248; *Chem. Abstr.* 1968, 69, 27686 q).

P. cerasoides D. Don syn. *P. puddum* (Roxb. ex Ser.) Roxb. ex Brand. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 204).

Synthesis of padmakastein and its derivatives (*Proc. Indian Acad. Sci.* 1958, 48A, 175; *Chem. Abstr.* 1961, 55, 22301 i); β -sitosterol behenate, tectochrysin, genistein, leucocyanidin and 4'-glucoside of genkwanin from stem bark (*Indian J. Chem.* 1969, 7, 43).

NEW COMPOUNDS



Genkwanin-4'-glucoside

P. cerasus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 204).

Kaempferol (1.03%) from leaves (*C. R. Acad. Sci. Paris*, Ser. D 1959, 249, 2866; *Chem. Abstr.* 1960, 54, 13282 e).

P. communis Huds.; see *P. domestica* L.

P. cornuta (Wall. ex Royle) Steud. syn. *P. padus* Hook.f. (non L.), *Padus cornuta* (Wall. ex Royle) Carr. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 205).

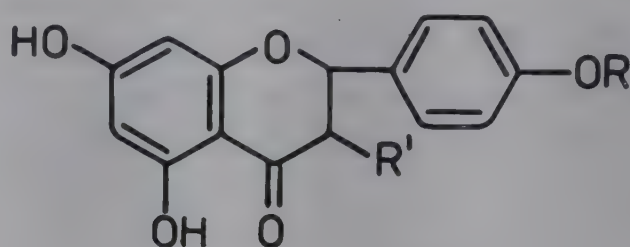
β -Sitosterol, its glucoside, docosan-1,22-diol, umbelliferone and leucocyanidin isolated from stem bark (*Indian J. Chem.* 1969, 7, 43).

P. domestica L. syn. *P. communis* Huds. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 205).

Kaempferol (0.19%) from leaves (*C.R. Acad. Sci. Paris*, Ser. D 1959, 249, 2866; *Chem. Abstr.* 1960, 54, 13282 e); rutoside and quercetin-3-rhamnoglucoside from leaves (*C.R. Acad. Sci. Paris*, Ser. D 1959, 249, 2423; *Chem. Abstr.* 1960, 54, 12378 b); a new dihydroflavonol - 3,5,7-trihydroxy-4'-methoxyflavone (dihydrokaempferide), mp. 205° - from heartwood (*J. Sci. Ind. Res.* 1961, 20B, 509); dihydrokaempferide, prudomestin, mp. 209°, kaempferol,

an unidentified dihydroflavonol, mp. 239° and leucoanthocyanidin from heartwood (*Phytochemistry* 1964, 3, 477); gum hydrolysate contained 6-O-(β -glucuronopyranosyl)-D-galactose, 6-O-(4-O-methyl- β -D-glucuronopyranosyl)-D-galactose and 2-O-(β -D-glucuronopyranosyl)-D-mannose, in addition to rhamnose, xylose, arabinose and galactose (*Collect. Czech. Chem. Commun.* 1965, 30, 3582); kaempferol, kaempferide, aromadendrin and dihydrokaempferide from heartwood (*Curr. Sci.* 1966, 35, 409); structural features of acidic polysaccharide from gum studied (*Chem. Zvesti* 1967, 21, 13; *Chem. Abstr.* 1968, 68, 29957 g).

NEW COMPOUNDS



Aromadendrin

$R = H, R' = \alpha\text{-OH}$

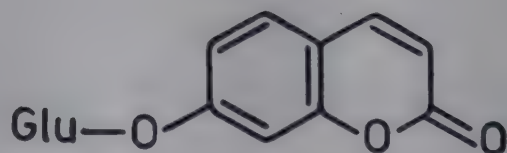
Dihydrokaempferide

$R = \text{Me}, R' = \text{OH}$

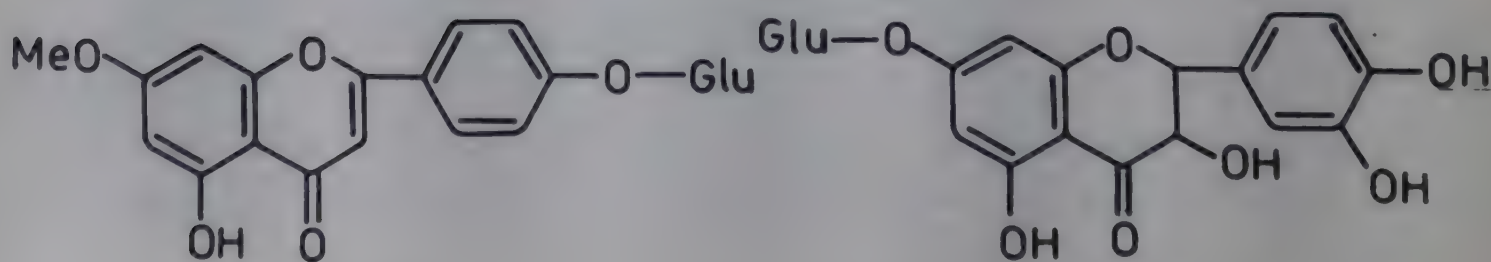
P. mahaleb L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 205).

Kaempferol (0.74%) from leaves (*C.R. Acad. Sci. Paris. Ser. D* 1959, 249, 2866; *Chem. Abstr.* 1960, 54, 13282 e); prunitroside, mp. 181° , prunetin, 7-methoxycoumarin and a new glycoside - mahaleboside - isolated from bark and their structures elucidated (*C.R. Acad. Sci. Paris, Ser. D* 1960, 250, 594; *Chem. Abstr.* 1960, 54, 16547 g); two flavonol glucosides characterised as 7-glucopyranosyloxy-3,4',5-trihydroxyflavanone (aromadendrin-7-glucoside) and 7-glucopyranosyloxy-3,3',4',5-tetrahydroxyflavanone (taxifolin-7-glucoside), mp. 260° (*C.R. Acad. Sci. Paris, Ser. D* 1960, 251, 1653; *Chem. Abstr.* 1961, 55, 5677 d; *C.R. Acad. Sci. Paris, Ser. D* 1961, 253, 1178; *Chem. Abstr.* 1962, 56, 7259 i); choline isolated from kernels (*Planta Med.* 1965, 13, 23).

NEW COMPOUNDS



Mahaleboside



Prunitroside

Taxifolin-7-glucoside

P. padus L.; see *P. cornuta* (Wall. ex Royle) Steud.

P. persica (L.) Batsch (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 205).

Alcoholic extract of embryo and immature seeds showed kinin activity (*Nature* 1964, 204, 602).

Kaempferol (1.2%) from leaves (*C.R. Acad. Sci. Paris*, Ser. D 1959, 249, 2866; *Chem. Abstr.* 1960, 54, 13282 e); kaempferol-3-galactoside from flowers (*Chem. Pharm. Bull.* 1960, 8, 647); 3,4',5-trihydroxyflavanone-7- β -D-glucopyranoside (aromadendrin-7-glucoside) (*C.R. Acad. Sci. Paris*, Ser. D 1960, 251, 1653; *Chem. Abstr.* 1961, 55, 5677 d); isolation of taxifolin-7-glucoside and aromadendrin-7-glucoside (*C.R. Acad. Sci. Paris*, Ser. D 1961, 253, 1178; *Chem. Abstr.* 1962, 56, 7259 i); 6-O-(β -glucuronopyranosyl)-D-galactose, 6-O-(4-O-methyl- β -D-glucuronopyranosyl)-D-galactose and 2-O-(β -D-glucuronopyranosyl)-D-mannose in addition to rhamnose, xylose, arabinose and galactose from gum (*Collect. Czech. Chem. Commun.* 1965, 30, 3582); naringenin, aromadendrin, 5,3'-dihydroxy-7,4'-dimethoxyflavanone, mp. 163° and its 5-glucoside, isolated from bark; former two characterised as 5,7,4'-trihydroxyflavanone and 5,7,4'-trihydroxyflavanol respectively (*Tetrahedron Lett.* 1966, 1293; *Aust. J. Chem.* 1968, 21, 539); structure elucidation studies polysaccharides from gum by partial hydrolysis to oligosaccharides (*Chem. Zvesti* 1966, 20, 577; *Chem. Abstr.* 1966, 65, 17035 c).

P. puddum (Roxb. ex Ser.) Roxb. ex Brand.; see *P. cerasoides* D. Don

P. salicina Lindl. syn. *P. triflora* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 205).

β -Sitosterol, myricyl alcohol and two compounds, mp. 98° and 117°, from bark (*J. Indian Chem. Soc.* 1966, 43, 65).

P. triflora Roxb.; see *P. salicina* Lindl.

P. undulata Buch.-Ham. ex D. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 205).

α -Eleostearic acid (22.4), linolenic acid (0.6), linoleic acid (19.4) and oleic acid (52.6%) by saponification of seed oil (*Indian J. Appl. Chem.* 1964, 27, 1; *Chem. Abstr.* 1964, 61, 9773 a).

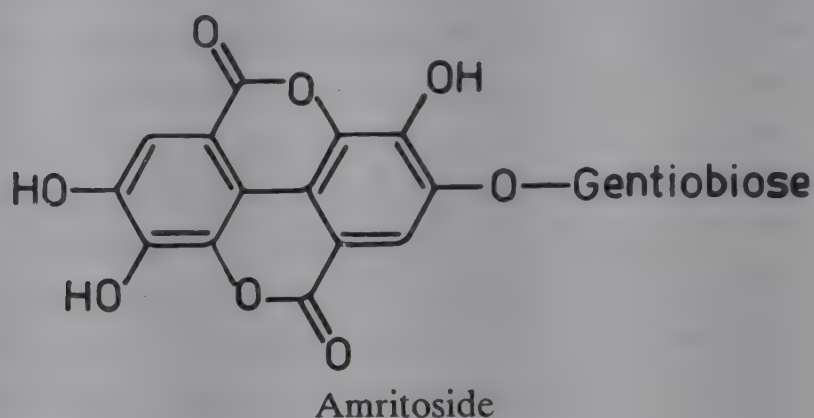
PSIDIUM (Myrtaceae)

P. guajava L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 205).

Presence of flavonoids - quercetin and avicularin - in Egyptian plant by PC (*Bull. Fac. Pharm. Egypt* 1963, 2, 107; *Chem. Abstr.* 1965, 62, 5574 f); isolation of an arabinan, composed of galacturonic acid, galactose, arabinose with traces of xylose and rhamnose, from fruits (*Aust. J. Chem.* 1965, 18, 851); leucocyanidin, luteic and ellagic acids and a new glycoside - amritoside, mp. 248° - from stem bark (*Phytochemistry* 1965, 4, 317); quercetin-3- α -arabinopyranoside from leaves (*Phytochemistry* 1965, 4, 989); Me arjunolate isolated from

roots (*Bull. Chem. Soc. Jpn.* 1966, 39, 1816); a new sesquiterpene - sesquiguavaene - from leaves (*Perfum. Essent. Oil. Rec.* 1967, 58, 707; *Chem. Abstr.* 1968, 68, 22071 e); an ester of hexahydroxydiphenic acid with arabinose present in unripe fruits but absent in ripe fruits which contain free ellagic acid (*Phytochemistry* 1968, 7, 641).

NEW COMPOUNDS



PSOPHOCARPUS (Papilionaceae)

P. tetragonolobus (L.) DC.

Eng. - Goa bean; B. - Chara-koni-sem, Lakar-sem; Tam. - Morisuavarai; Kan. - Shambekayi; Bo. - Chavdhari ghevda.

Distribution : Cultivated in Karnataka, Maharashtra, Bengal, Tamilnadu and elsewhere.

BIOLOGICAL ACTIVITY

Lectin (FR-16) from seed showed anti-H type serological specificity. Its modification with certain carbohydrates studied (*Indian J. Med. Res.* 1967, 55, 369).

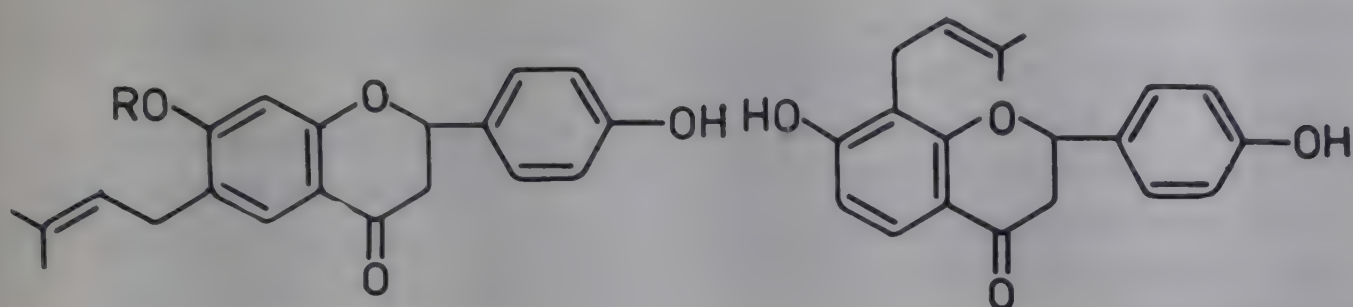
PSORALEA (Papilionaceae)

P. corylifolia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 206).

Essential oil from fruits used internally as tonic and as aphrodisiac against impotency and externally for treatment of leucoderma, psoriasis and leprosy (*Riechst. Aromen, Koerperpflegem.* 1964, 14, 409; *Chem. Abstr.* 1965, 62, 14419 g). Seed extract possessed anthelmintic activity (*Indian J. Pharm.* 1965, 27, 198).

Psoralen and isopsoralen isolated from seed kernels (*Indian J. Appl. Chem.* 1959, 22, 82; *Chem. Abstr.* 1960, 54, 12275 a); psoralidin from seeds characterised as 6-(3-methyl-2-butenyl) coumestrol (*Chem. Ind.* 1960, 48; *Tetrahedron* 1961, 14, 275); bakuchiol, bp. 145°/0.1 mm., from seeds (*Tetrahedron Lett.* 1966, 4561); structures of new flavonoids bavachinin, bavachalcone, bavachin, isobavachin and isobavachalcone elucidated (*Tetrahedron Lett.* 1968, 2401).

NEW COMPOUNDS



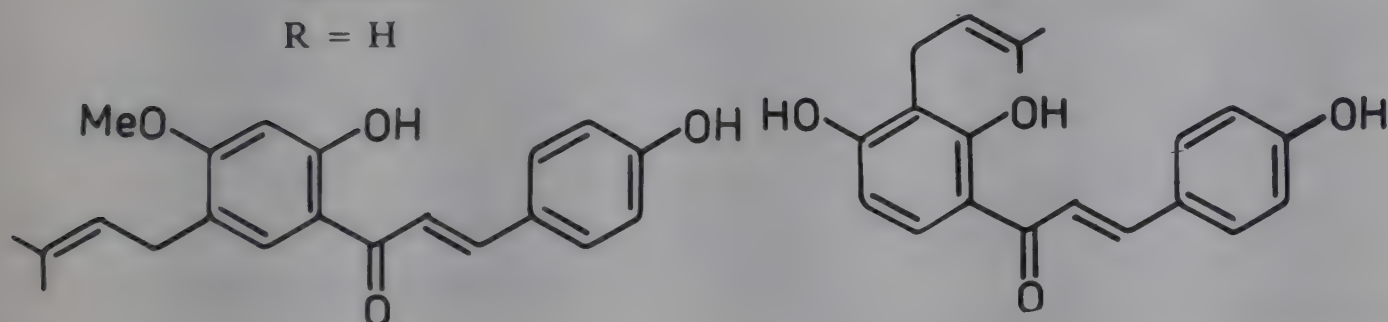
Bavachinin

R = Me

Bavachin

R = H

Isobavachin



Bavachalcone

Isobavachalcone

BIOLOGICAL ACTIVITY

Psoralen administered orally for 2.5 months at 1, 2 and 4 times human dose of 30 mg/day affected detoxication mechanism in rabbits (*J. Sci. Ind. Res.* 1962, 21B, 132); toxic effects of psoralen, isopsoralen and imperatorin, used in the treatment of leucoderma, were studied on rats at daily dose of 2.5 mg/75g for 60 days. Psoralen and imperatorin alone, or mixed, had no effect on growth or weight, but postmortem revealed congestion and enlargement of liver and weight of spleen was doubled. Hyalinisation of lung alveoli was observed in one rat and haemorrhage from mouth, nose and anus in two others. A mixture of psoralen, isopsoralen and imperatorin caused hypertrophy of liver, kidney and spleen (*J. Sci. Ind. Res.* 1960, 19C, 223).

PTERIDIUM (Pteridaceae)

P. aquilinum (L.) Kunth syn. *Pteris aquilina* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 206).

3,4-Dihydroxycinnamic acid, mp. 190°, showed high antithiamine activity (*Experientia* 1967, 23, 996); prunasin isolated (*Dank. Tidsskr. Farm.* 1968, 42, 301; *Chem. Abstr.* 1969, 71, 10244 n; *Phytochemistry* 1968, 7, 151).

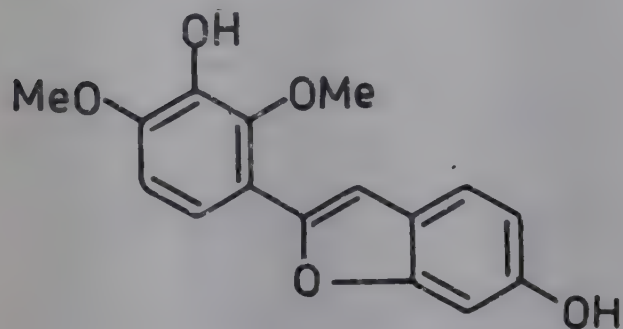
PTERIS (Pteridaceae)

P. aquilina L.; see *Pteridium aquilinum* (L.) Kunth

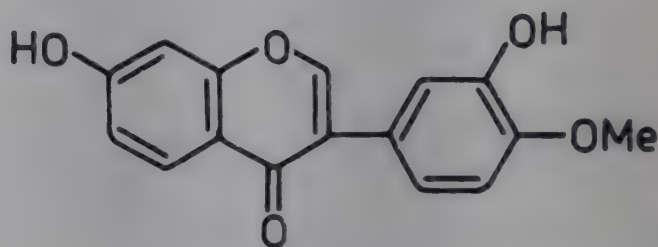
PTEROCARPUS (Papilionaceae)

P. dalbergioides Roxb. syn. *P. indicus* Baker (non Willd.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 206).

Formononetin, mp. 265°, isoliquiritigenin, mp. 200°, (-)-p-hydroxyhydratropic acid, mp. 141° and a new 2-arylbenzofuran - pterofuran, mp. 208° - from heartwood (*Aust. J. Chem.* 1964, 17, 379); pterocarpol, mp. 104° and β -eudesmol from heartwood (*Curr. Sci.* 1965, 34, 115); 3'-hydroxyformononetin isolated from heartwood (*Indian J. Chem.* 1969, 7, 118).

NEW COMPOUNDS

Pterofuran



3'-Hydroxyformononetin

P. indicus Willd.; see *P. dalbergioides* Roxb.

P. marsupium Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 206).

Extractive of heartwood showed statistically significant hypoglycaemic action in fasting rabbits three and five hours after oral administration. No harmful effect noticed in doses which showed hypoglycaemic action (*Indian J. Med. Res.* 1967, 55, 166).

P. santalinus L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 206).

Pterocarpol from heartwood (*Tetrahedron* 1968, 24, 6231).

PTERYGOTA (Sterculiaceae)

P. alata (Roxb.) R.Br. syn. *Sterculia alata* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 207).

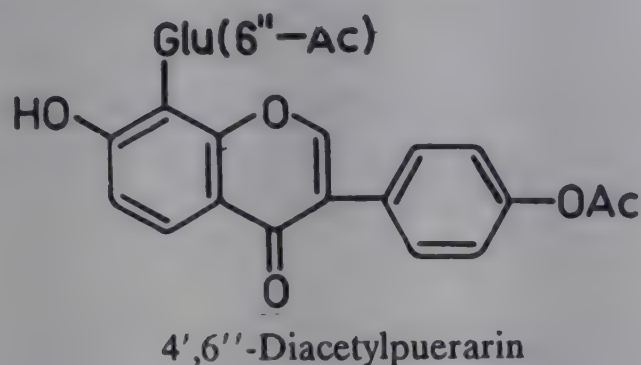
Sterculynic acid from seed oil identified as 8,9-methyleneoctadec-8-en-17-ynoic acid (*Tetrahedron Lett.* 1968, 2167).

PUERARIA (Papilionaceae)

P. tuberosa (Roxb. ex Willd.) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 207).

β -Sitosterol, stigmasterol, daidzein, puerarin and a new isoflavone C-glycoside - 4',6''-diacetylpuerarin - from roots (*Indian J. Chem.* 1969, 7, 210).

NEW COMPOUNDS



PULICARIA (Asteraceae)

P. dysenterica (L.) Gaertn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 207).

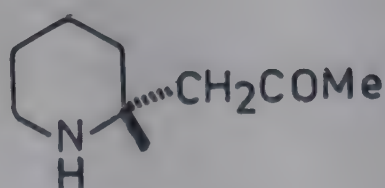
Two straight chain polyacetylenes and polyenes along with 5,6,3'-trihydroxy-3,7,4'-trimethoxyflavone, mp. 210°, kaempferol-3-glucoside and caffeic acid from aerial parts (*Arch. Pharm.* 1968, 301, 115; *Chem. Abstr.* 1968, 68, 84927 x).

PUNICA (Punicaceae)

P. granatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 207).

Pelletierine from root bark characterised as (-)-3-(2-piperidiny)propan-2-one (*Bull. Chem. Soc. Jpn.* 1960, 33, 1668; *Bull. Soc. Chim. Fr.* 1961, 1993); 2-propenyl-3,4,5,6-tetrahydropyridine isolated from leaves as unstable hydrochloride, mp. 112° (*Phytochemistry* 1967, 6, 711); absolute configuration of pelletierine (*Rec. Trav. Chim.* 1967, 86, 80).

NEW COMPOUNDS



Pelletierine

PUTRANJIVA (Euphorbiaceae)

P. roxburghii Wall.; see *Drypetes roxburghii* (Wall.) Hurus

PYRUS (Rosaceae)

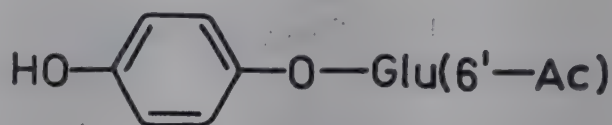
P. aucuparia Gaertn.; see *Sorbus aucuparia* L.

P. communis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 208).

A compound, mp. 214°, related to arbutin, isolated from seedlings (*Pharmazie* 1960, 15,

319; *Chem. Abstr.* 1961, 55, 5870 e); arbutin acetate (pyroside) in which Ac is attached to C-6 of glucose isolated from leaves (*Pharmazie* 1960, 15, 650; *Chem. Abstr.* 1962, 56, 13010 i; *Bull. Nat. Inst. Sci. India* No. 31, 1965, 179; *Chem. Abstr.* 1967, 66, 52918 n); friedelin (0.5) and epifriedelinol (0.1%) from bark (*J. Indian Chem. Soc.* 1964, 41, 859); presence of arbutin, a glycoside composed of glucose and hydroquinone, detected by colour reactions (*Farm. Pol.* 1966, 22, 579; *Chem. Abstr.* 1967, 67, 54395 j).

NEW COMPOUNDS



Arbutin acetate

P. malus L.; see *Malus pumila* Mill.

P. pashia Buch.-Ham. ex D. Don.

H. - Mehal, Mol; P. - Kaenth, Batangi, Tang; Assam - Shor-shur, Chalthri.

Friedelin (0.5) and β -sitosterol (0.01%) from bark; n-triacontane (1.0), myricyl alcohol (0.005%) as chloride and - sitosterol from leaves (*J. Indian Chem. Soc.* 1964, 41, 83).

Distribution : Himalayas from Kashmir to Bhutan, alt. 1200 - 2500 m., Khasi Hills, alt. 1400-1600 m.

QUASSIA (Simaroubaceae)

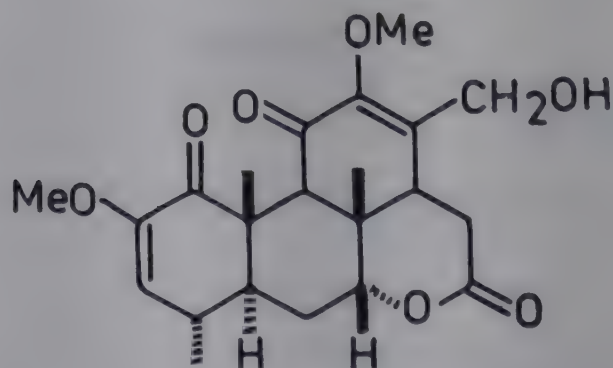
Q. amara L.

Eng. - Surinam quassia.

β -Sitosterol and β -sitostenone from wood oil (*J. Chem. Soc.* 1963, 5001); isolation of quassin, isoquassin, neoquassin and a new amaroid - 18-hydroxyquassin, mp. 232° (*Ann. Ist. Super. Sanita* 1966, 2, 414; *Chem. Abstr.* 1967, 66, 75879 q).

Distribution : Indigenous to Brazil and Guiana, grown in Indian gardens.

NEW COMPOUNDS



18-Hydroxyquassin

Q. indica (Gaertn.) Nooteb.; see *Samadera indica* Gaertn.

QUERCUS (Fagaceae)

Q. incana Roxb.; see *Q. leucotrichophora* A. Camus ex. Bahadur

Q. leucotrichophora A. Camus ex Bahadur syn. *Q. incana* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 208).

Quercetin and its 3-O-disaccharide from leaves (*Curr. Sci.* 1966, 35, 204).

Q. robur L.

Eng. - English or European oak.

Friedelin, 3 α -friedelanol, quercetin and mixture of leucoanthocyanidins from bark; quercetin, leucopelargonidin from heartwood (*Curr. Sci.* 1966, 35, 204).

Distribution : Introduced into India in hills, Nilgiris and Himachal Pradesh.

QUILLAJA (Rosaceae)

Q. saponaria Molina.

Eng. - Soap bark, Quillaia bark.

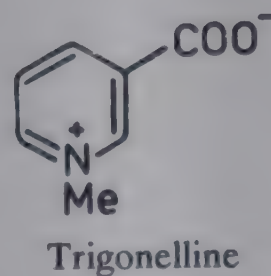
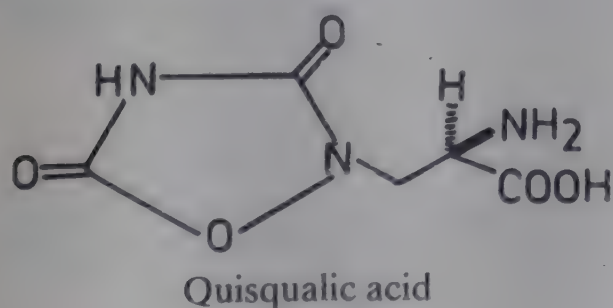
Isolation of quercetin, kaempferol, leucocyanidin, caffeic and p-coumaric acids (*Phytochemistry* 1965, 4, 535).

Distribution : Native of western slopes of Andes in Chile and Peru, grown in Indian gardens.

QUISQUALIS (Combretaceae)

Q. indica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 208).

Trigonelline, L-proline, L-asparagine and quisqualic acid from leaves (*Hua Hsueh Hsueh Pao* 1964, 30, 226; *Chem. Abstr.* 1964, 61, 7359 f).

NEW COMPOUNDS**RANDIA** (Rubiaceae)

R. dumetorum Lamk.; see *Xeromphis spinosa* (Thunb.) Keay

R. uliginosa DC.; see *Xeromphis uliginosa* (Retz.) Maheshwari

RAPHANUS (Brassicaceae)

R. sativus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956,

p. 209).

(-)-Sulforaphene from seeds (*Bull. Sci. Cons. Acad. RSF Yougosl.* 1965, 10, 211; *Chem. Abstr.* 1966, 64, 7038 g).

RAUVOLFIA (RAUWOLFIA) (Apocynaceae)

R. canescens L.; see *R. tetraphylla* L.

R. decurva Hook.f.; see *R. densiflora* (Wall.) Benth. ex Hook.f.

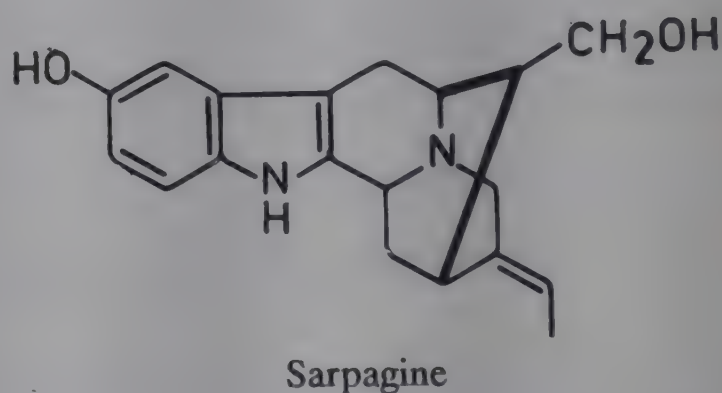
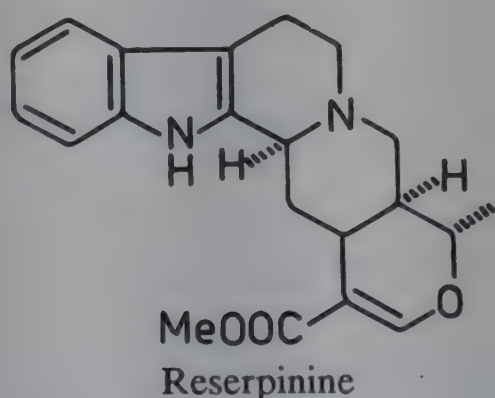
R. densiflora (Wall.) Benth. ex Hook.f. syn. *R. decurva* Hook.f.

Meghalaya - Larkei, Dieng-lar-kei, Dieng-soh-bubleng.

Sarpagine (raupine), mp. 340° and reserpine, mp. 238°, from roots (*J. Sci. Ind. Res.* 1962, 21B, 454); densiflorine identified in alkaloidal fraction (*J. Proc. Inst. Chemist* 1963, 35, 131; *Chem. Abstr.* 1963, 59, 15811 h).

Distribution : Meghalaya, alt. 300-1500 m, Western and Eastern Ghats, alt. 1800 m.

NEW COMPOUNDS



BIOLOGICAL ACTIVITY

Densiflorine lowered blood pressure, decreased amplitude of frog heart contraction, slightly contracted rat ileum and slightly increased respiration (*J. Proc. Inst. Chemists* 1963, 35, 131; *Chem. Abstr.* 1963, 59, 15811 h).

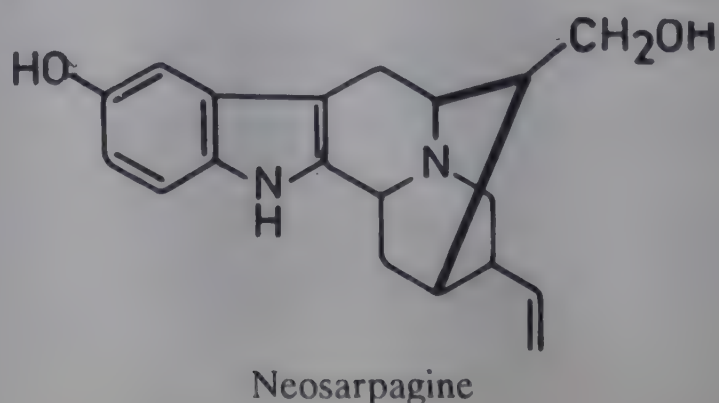
R. micrantha Hook.f.

Malabar - Rauwolfia.

Raunamine, mp. 206° and neosarpagine, mp. 390°, from root bark (*J. Sci. Ind. Res.* 1960, 19B, 135).

Distribution : Kerala, upto an alt. of 300 m.

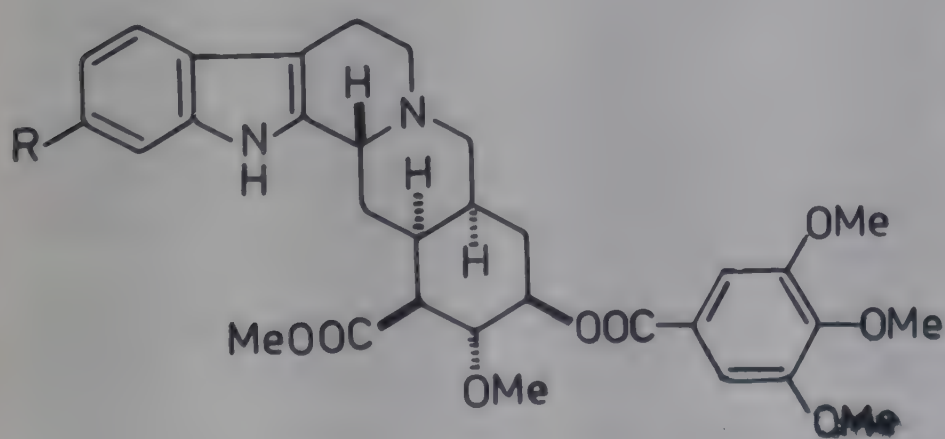
NEW COMPOUNDS



R. serpentina (L.) Benth. ex Kurz (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 210).

Structure elucidation of reserpine and deserpidine (*J. Am. Chem. Soc.* 1959, 81, 2481); essential oil (0.22%) from roots yielded chief terpene constituent - serpoterpine, bp. 131° (*Bull. Res. Inst. Univ. Kerala* 1959, 6, 14; *Chem. Abstr.* 1960 54, 16746 g); isolation of reserpine, mp. 360° , ajmaline, mp. 158° , serpentine, mp. 155° , serpentinine, mp. 265° and ajmalicine (δ -yohimbine), mp. 250° , from roots (Jpn. 15,364 (1960) October 14; *Chem. Abstr.* 1961, 55, 3933 a; *Yakugaku Zasshi* 1960, 80, 1357; *Chem. Abstr.* 1961, 55, 6511 e; Fr. 1,397,537 (1965) April 30; *Chem. Abstr.* 1966, 65, 4284 b); reserpine, serpajmaline (mixture of serpentine, serpentinine, ajmaline and 2 unknown compounds, free of reserpine), resajmaline (mixture of serposterol and unsaturated higher alcohols), rescinnamine and ajmalexine (mixture of reserpine and rescinnamine) were isolated from roots (Ger. 1,117,593 (1961) Nov. 23; *Chem. Abstr.* 1962, 56, 98); detection of reserpine, reserpinine, yohimbine, ajmaline, serpentine and serpentinine by PC (*Sem. Med.* 1962, 120, 316; *Chem. Abstr.* 1962, 57, 2332 e); serpentinine characterised as 3-hydroxyserpentine (*Sci. Cult.* 1959, 25, 84); absolute stereochemistry of ajmaline and isoajmaline (*J. Am. Chem. Soc.* 1960, 82, 3792; *ibid.* 1962, 84, 622); raugalline isolated and identified as ajmaline (*Ann. Pharm. Fr.* 1960, 18, 817; *Chem. Abstr.* 1961, 55, 13773 g; *Ann. Pharm. Fr.* 1963, 21, 321; *Chem. Abstr.* 1963, 59, 7317 h); detection of raunatine in root extract by PC (*Med. Prom. SSSR* 1961, 15, 25; *Chem. Abstr.* 1962, 57, 954 f); stereochemical studies in structure elucidation of yohimbine and reserpine (*Tetrahedron Lett.* 1962, 181; *Tetrahedron* 1964, 20, 2877); a review on structure of *Rauwolfia* alkaloids (*Pharm. Ind. Yugosl.* 1964, 35; *Chem. Abstr.* 1967, 67, 25368 x).

NEW COMPOUNDS



Deserpidine

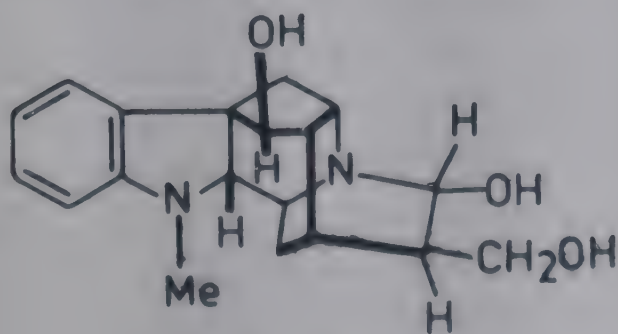
R = H

Reserpine

R = OMe



Yohimbine



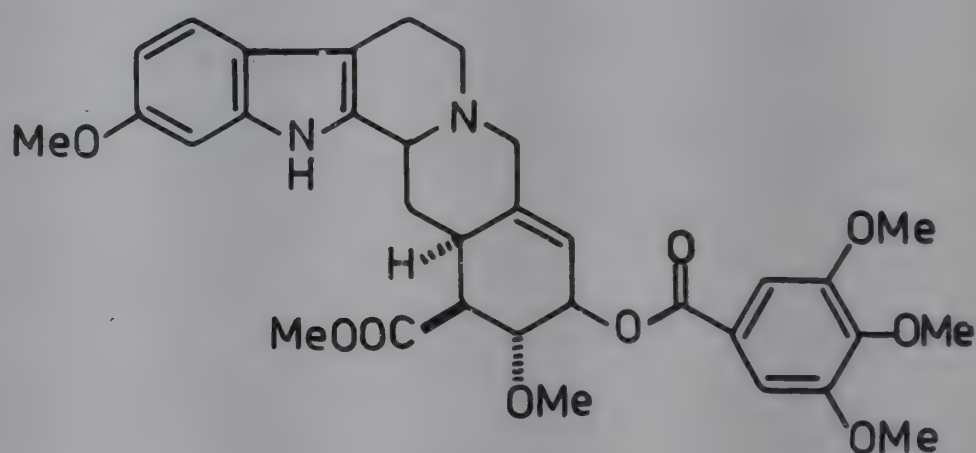
Ajmaline

R. tetraphylla L. syn. *R. canescens* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 210).

Total alkaloidal extract of leaves caused prolonged fall in blood pressure in rabbits (*Gifu Yakka Daigaku Kiyo* 1963, 11, 18; *Chem. Abstr.* 1964, 60, 16384 h).

Rauwolscine identical with α -yohimbine (*J. Indian Chem. Soc.* 1959, 36, 685); isolation of α -, β - and γ -deserpidines, mp. 228°, 230° and 138° respectively (US 2,982,769 (1961) May 2; *Chem. Abstr.* 1961, 55, 17680 g); structure and stereochemistry of raujemidine (*Tetrahedron Lett.* 1964, 2277); ajmalicine, ajmaline, reserpine, sarpagine, mp. 304°, α -yohimbine, aricine, mp. 189° and serpiline isolated from roots (*Khim. Prir. Soedin.* 1969, 5, 64; *Chem. Abstr.* 1969, 70, 112375 c).

NEW COMPOUNDS



Raujemidine

BIOLOGICAL ACTIVITY of *Rauvolfia* alkaloids

A total alkaloidal preparation (egalin) at high concentration showed an initial stimulating action followed by paralytic action on isolated rabbit intestine, while reserpine showed paralytic action irrespective of concentration (*Tohoku Igaku Zasshi* 1960, 62, 554; *Chem. Abstr.* 1963, 58, 4937 b). Differential activating influence of total and reserpine-free alkaloids on the activity of cathepsins indicated the extent of influence exerted by reserpine on catheptic enzyme activity (*Indian J. Med. Res.* 1960, 48, 610).

Serpajmaline (a reserpine-free mixture of serpentine, serpentinine, ajmaline and two other compounds) at 5 mg/kg dose, administered orally or i.m., reduced systolic blood pressure of conscious dogs for at least 24 hours. No side-effects were observed. It also produced bradycardia in anaesthetised animals and inhibited pressor and chronotropic actions of adrenaline and noradrenaline. It inhibited the actions of barium chloride and acetylcholine on intestine in vitro (*Pakistan J. Sci. Ind. Res.* 1959, 2, 93; *Chem. Abstr.* 1960, 54, 25290 a). Serpajmaline at a low dose of 0.25 mg/kg also showed antihypertensive effect in dogs while reserpine (2 mg/kg) had no influence. Injection of 0.5 mg/kg s.c. showed no sedative effect in contrast to reserpine. It is used as an antihypertensive and antispasmodic agent (Ger. 1,117,593 (1961) Nov. 23; *Chem. Abstr.* 1962, 56, 13019 i).

Ajmaline showed quinidine-like action against experimental auricular arrhythmias but was less effective than serpentine; 5-8 mg/kg completely abolished ventricular ectopic rhythm in

two out of eight dogs. It was less toxic than quinidine (*Arch. Int. Pharmacodyn. Ther.* 1959, 122, 323; *Chem. Abstr.* 1960, 54, 13454 n). LD₅₀ (mg/kg) of ajmaline in mice was 26 i.v., 105 i.p. and 440 p.o. It reduced hypertensive action of adrenaline and noradrenaline at 1-2 mg/kg in dogs and rats, but not the action of acetylcholine. It counteracted fibrillation caused by calcium chloride (200 mg/kg) in urethan-anaesthetised rats at i.v. dose of 2 mg/kg (*Arch. Int. Pharmacodyn. Ther.* 1960, 127, 163; *Chem. Abstr.* 1961, 55, 10708 b). After injecting ajmaline (50 mg i.v.) in forearm of twentyone healthy animals over a period of 2.5 minutes, its concentration in venous blood one minute after injection varied from 7.2 to 24 γ /10 ml serum. This accounted for less than 10% of injected amount indicating that ajmaline was very rapidly removed from circulation. After 5 and 30 minutes only 2.5 and 0.5% remained in circulation. Cardiac arrhythmias could be detected with ajmaline at a concentration of 0.5 γ /10 ml serum or higher. Thus, the effective concentration of ajmaline was approximately 1/20 that of quinidine (*Klin. Wochenschr.* 1962, 40, 149; *Chem. Abstr.* 1962, 57, 2802 a). Ajmaline was devoid of any strong or durable hypotensive effect and did not inhibit or block vasomotor reflexes, autonomic ganglia or peripheral adrenergic mechanism excepting adrenergic increase of heart rate (*Bull. Calcutta Sch. Trop. Med.* 1962, 10, 15; *Chem. Abstr.* 1963, 58, 7268 c). It was superior to quinidine and procainamide against extra systoles and showed useful adjunctive action in auricular fibrillation and other heart conditions (*Ann. Nancy* 1962, 1, 26; *Chem. Abstr.* 1963, 58, 2768 e). The cardiac action of isoajmaline was found to be equal to and of bromoajmaline greater than that of ajmaline after i.v. administration in rabbits. At low dose (4 mg) they prolonged the electrocardiographic QRS complex by 25-50% and at higher doses (7.5-10 mg) produced, in addition, atrioventricular block and asystole (*Z. Gesamte Exp. Med.* 1962, 135, 350; *Chem. Abstr.* 1962, 57, 1501 a). Optimal effective doses of ajmaline and bromoajmaline elevated the fibrillation threshold in guinea pig heart from 10-12 mA. to 50 mA. in a few minutes. The effect slowly wore off and disappeared after fifty minutes (*Arch. Exp. Pathol. Pharmacol.* 1962, 243, 519; *Chem. Abstr.* 1963, 58, 1827 b). Combination of ajmalicine (1-10 mg) and theophylline (0.1-0.5 g) has been used for oral, rectal or parenteral application in the treatment of cardiovascular and hypertensive diseases. LD₅₀ in mice and rabbits was 200 mg/kg i.p. and 500 mg/kg orally (*Fr. M.* 5,933 (1968) May 13; *Chem. Abstr.* 1969, 71, 33412 e). LD₅₀ and LD₁₀₀ of raugalline (ajmaline) by i.v. route in mice were 33 and 40 mg/kg respectively. It had weak parasympatholytic properties (*Ann. Pharm. Fr.* 1962, 20, 19; *Chem. Abstr.* 1962, 57, 2807 b).

Chandrine and serpakrine did not profoundly influence the activity or behaviour of intact animals unless administered in very large doses. They showed marked hypotensive effect. Effects of chandrine or serpakrine per se on smooth muscle organs were not pronounced but antiacetylcholine activity was observed (*Can. J. Biochem. Physiol.* 1960, 38, 889; *Chem. Abstr.* 1960, 54, 25307 f).

Deserpidine and its derivatives showed sedative and hypotensive effect (US 2982,769 (1961) May 2; *Chem. Abstr.* 1961, 55, 17680 g). Rauwolfine depressed electrical activity of brain at i.v. dose of 3 mg/kg for a period of 90 minutes. A higher dose of 5 mg/kg partially counteracted seizure-inducing properties of metrazole (*Indian J. Physiol. Allied. Sci.* 1969, 13, 94; *Chem.*

Abstr. 1960, 54, 13406 h). Rauwolscine had stimulant effect on CNS. At 20 mg/kg i.p. it caused restlessness and hyperreflexia for about one hour in guinea pigs and rabbits. At 80-100 mg/kg respiration increased followed by convulsions with some deaths. When it was injected i.m. into rats at 20 mg/kg/day for 20 days, body weight did not change (*Arch. Int. Pharmacodyn. Ther.* 1961, 134, 447; *Chem. Abstr.* 1962, 56, 12253 d). Non-specific spasmolytic action of rauwolscine was reversed by a number of TCA cycle intermediates (malic, α -ketoglutaric and citric acids). Antidiuretic effect of rauwolscine and morphine, when given in combination, was additive. The antidiuretic effect of rauwolscine provides yet another similarity with its isomer yohimbine (*Arch. Int. Pharmacodyn. Ther.* 1962, 138, 105; *Chem. Abstr.* 1962, 57, 14374 c).

Raunatine was much less toxic than reserpine; LD₅₀ values were 102 and 14.3 mg/kg respectively in mice. At 1.6-3.2 mg/kg dose, it lowered blood pressure in cats by 30-40% in 30 minutes and reduced the pressor response to carotid occlusion (*Farmakol. Toksikol.* 1961, 24, 529; *Chem. Abstr.* 1962, 56, 14879 f).

Reserpine and serpine, dissolved in CIBA'S vehicle, were tested for their effect on blood sugar level in chloralosed cats. Reserpine caused increase in sugar level whereas serpine produced persistent hypoglycaemia (*Bull. Calcutta Sch. Trop. Med.* 1959, 7, 8, 9; *Chem. Abstr.* 1960, 54, 13442 i, 13443 b); on injection of reserpine (50 γ /100 g) and ¹³¹I(5 γ) in rats, uptake of ¹³¹I by thyroid first increased and then decreased during 24 hr. postinjection as did histological evidence of activity in hypothalamo-hypophyseal system in comparison with controls (*Gunma J. Med. Sci.* 1959, 8, 281; *Chem. Abstr.* 1961, 55, 8647 d). Reserpine (0.15-0.3 mg/kg i.p.) decreased the toxicity of strophanthin (0.02 mg/kg i.v.) by 60% in guinea pigs and mice. Reduction of toxicity was accompanied by bradycardia (*Bratislav. Lekarske Listy* 1960, 40, 481; *Chem. Abstr.* 1961, 55, 1938 a).

Effect of i.v. injection of 0.5 mg/kg reserpine, rescinnamine, raupine, ajmaline, yohimbine and a mixture of these compounds (rauwoipur) in dog was studied. After 30 minutes there was fall in blood pressure in all cases except with ajmaline; yohimbine showing the maximum fall (32%). A combined dose of 0.2, 0.5, 0.12, 0.28 and 1.2 mg of the respective alkaloids reduced blood pressure (19%) and peripheral resistance (27%) and increased minimum volume (25%) (*Magy. Belorv. Arch.* 1959, 12, 169; *Chem. Abstr.* 1964, 60, 9791 a; *Z. Gesamte Inn. Med. Grenzgeb.* 1961, 16, 424; *Chem. Abstr.* 1961, 55, 22593 g). Daily administration of reserpine inhibited thyroid activity in mice, but this effect appeared to be due to reduced food intake and inanition (*C.R. Soc. Biol.* 1961, 155, 2356; *Chem. Abstr.* 1962, 57, 6553 f). Reserpine (1 mg/kg i.v.) reduced oxygen consumption to the level found in deep barbiturate narcosis. The body temperature was reduced by 2-3° at 30° and by 1.5° at 20° (*Arzneim. Forsch.* 1962, 12, 435).

Antileukaemic activity of the alkaloids was studied in L 1210 leukaemia test system in mice, with 6-mercaptopurine as control compound. Deserpidine showed the greatest activity and prolonged the survival time of mice by 50%; rescinnamine and reserpine had lesser effect; in general, these alkaloids showed antileukaemic activity only at doses which produced marked depression (*Arch. Int. Pharmacodyn. Ther.* 1960, 129, 125; *Chem. Abstr.* 1961, 55, 9685 a).

Bleeding time in rabbits remained normal after i.v. administration of heparin (1.1-1.5 mg/kg) or reserpine (0.4-0.6 mg/kg). In rabbits treated with reserpine, the blood clotting mechanism remained normal but platelet clumping in native or citrated plasma was absent (*Thromb. Diath. Haemorrh.* 1962, 7, 507; *Chem. Abstr.* 1962, 57, 13146 f).

Reserpine, canescine and rescinnamine depleted the adrenaline store of adrenal medulla to a high degree. There was a positive correlation between sedative potency of these alkaloids and adrenaline depletion of adrenals. Experiments in rabbits following denervation of the left adrenal gland by cutting the splanchnic nerve a week previously, showed that both adrenals were depleted by reserpine but to different extents; the adrenaline content of denervated gland was about thirty times that of intact gland (*Arzneim. Forsch.* 1957, 7, 279).

Serpentine had quinidine-like action against experimental auricular arrhythmias. In five out of eight dogs, serpentine at 3.5-8.0 mg/kg completely suppressed ventricular ectopic rhythm and restored normal sinus rhythm; in three cases, the effect was incomplete but ectopic activity was diminished. It showed lower toxicity than quinidine (*Arch. Int. Pharmacodyn. Ther.* 1959, 122, 322; *Chem. Abstr.* 1960, 54, 13454 h); hypotensive action of i.v. acetylcholine was not modified by preceding injection of total alkaloids or reserpine but in some cases serpentine increased hypotensive action of acetylcholine in anaesthetised dogs. Contractions produced by acetylcholine in guinea pig ileum were decreased by serpentine, reserpine and total alkaloids, and were abolished completely at larger doses (*Pathol. Biol. Semaine Hopitaux Paris* 1958, 6, 59; *Chem. Abstr.* 1960, 54, 23073 c).

Administration of yohimbine (2-3 mg/kg) i.v. or i.m. resulted in increase of blood phosphorus by 24%. In deep hypothermic animals, blood potassium increased by 40% after chilling without administration of yohimbine, but remained unchanged in presence of yohimbine (*Therapie* 1960, 15, 247; *Chem. Abstr.* 1962, 57, 9175 i). Doses of yohimbine insufficient to produce peripheral adrenergic block, directly blocked carotid sinus receptors and depressed the medullary vasomotor centre. Rauwolscine was a more potent adrenergic blocking agent than yohimbine (*Arch. Int. Pharmacodyn. Ther.* 1961, 130, 266; *Chem. Abstr.* 1961, 55, 20184 g). Although lacking in true ptotic activity, yohimbine potentiated reserpine-induced blepharoptosis without altering the dose-response relationship, indicating that reserpine acts more by depletion of norepinephrine than by the release of serotonin (*J. Pharm. Sci.* 1962, 51, 345).

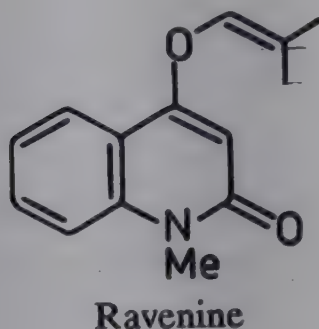
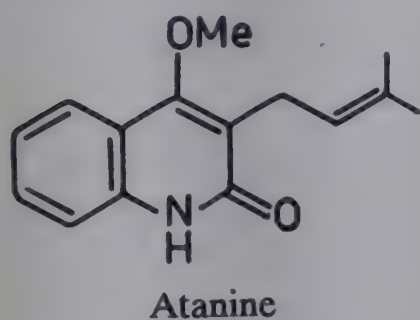
RAVENIA (Rutaceae)

R. spectabilis Engl.

Besides γ -fagarine, mp. 142° and arborinine, new quinolone alkaloids - ravenine, mp. 120°, ravenoline, mp. 144° and atanine - isolated and characterised (*Trans. Bose Res. Inst.* 1963, 26, 129; *Chem. Abstr.* 1966, 64, 9777 c; *Indian J. Chem.* 1969, 7, 678; *J. Indian Chem. Soc.* 1968, 45, 552).

Distribution : Planted in Indian Botanic Gardens, Howrah.

NEW COMPOUNDS

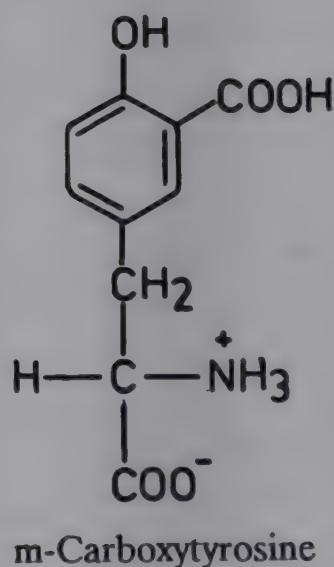


RESEDA (Resedaceae)

R. odorata L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 211).

Isolation and structure elucidation of new amino acid - m-carboxy-L-tyrosine-(3-(3-carboxy-4-hydroxyphenyl)-L-alanine) - from seeds (*Acta Chem. Scand.* 1962, 16, 142).

NEW COMPOUNDS



RHABDIA (Boraginaceae)

R. lycioides Mart.; see *Rotula aquatica* Lour.

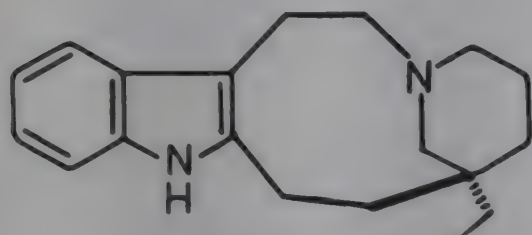
RHAZYA (Apocynaceae)

R. stricta Decne. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 212).

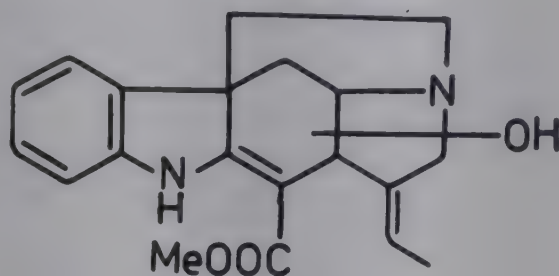
(-)-Quebrachamine (0.06%), mp. 141°, a new alkaloid - rhazine, mp. 234° - and two minor alkaloids, mp. 115° (rhazinine, 0.0008%) and mp. 278° (0.001%) isolated from roots (*Chem. Ind.* 1961, 1034; *ibid.* 1962, 266); rhazinine related to rhazine (*Chem. Ind.* 1962, 1623); a new alkaloid - sewarine, mp. 245° - isolated (*Pakistan J. Sci. Ind. Res.* 1966, 9, 97; *Chem. Abstr.* 1967, 67, 73735 m); two new flavonoid glycosides - rhazianosides A, mp. 250° and B, mp. 186° - along with ursolic acid and magnesium quinate isolated from leaves and characterised

(*Yakugaku Zasshi* 1967, 87, 430; *Chem. Abstr.* 1967, 67, 108938 j); secamine, its dihydro- and tetrahydro- derivatives isolated from leaves; in tetrahydrosecamine both C15,C20 and C15',C20' double bonds are saturated, whereas in dihydrosecamines only one bond is saturated (*Chem. Commun.* 1968, 859).

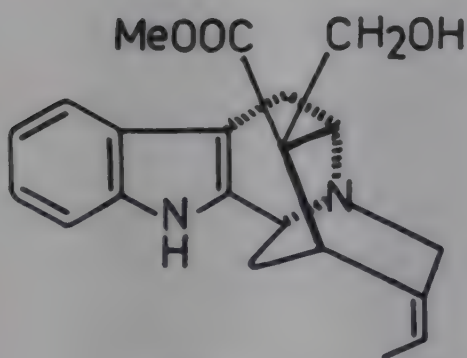
NEW COMPOUNDS



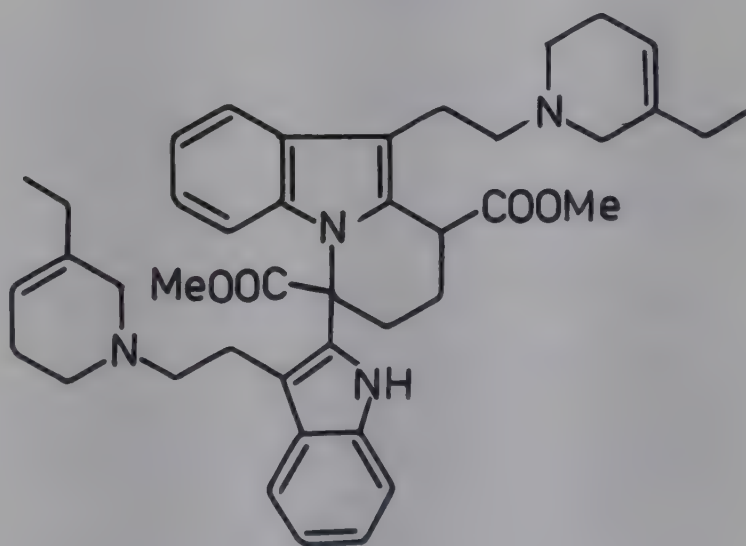
Quebrachamine



Searine



Rhazine



Secamine

BIOLOGICAL ACTIVITY

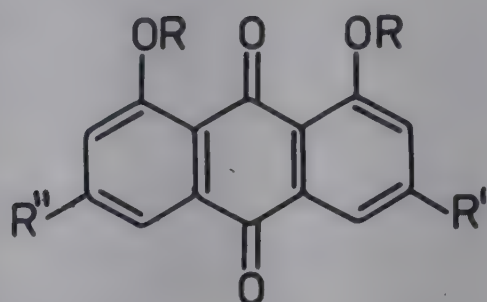
Searine possessed marked oncolytic activity (*Pakistan J. Sci. Ind. Res.* 1966, 9, 97; *Chem. Abstr.* 1967, 67, 73735 m).

RHEUM (Polygonaceae)

R. palmatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 212).

Structure of rhein established (*Arch. Pharm.* 1959, 292, 591; *Chem. Abstr.* 1960, 54, 12075 h; *J. Org. Chem.* 1961, 26, 979); five glucosides - physcion-1- or 8- β -D-glucoside hydrate, mp. 235°, aloeeodin-1- or 8- β -D-glucoside, chrysophanol-1 or 8- β -D-glucoside hydrate, mp. 245°, rheumemodin-1 or 8- β -D-glucoside hemihydrate, mp. 189°, and rhein-8- β -D-glucoside, mp. 266°, from rhizomes (*Z. Naturforsch.* 1963, 18, 89; *Chem. Abstr.* 1963, 59, 8854 g); a new dianthrone - reidin A - from roots composed of emodin anthrone and rhein anthrone (1:1) (*Pharm. Weekbl.* 1963, 98, 655; *Chem. Abstr.* 1964, 60, 365 f); glucogallin and (+)catechol identified in roots (*Arch. Pharm.* 1966, 299, 857; *Chem. Abstr.* 1967, 66, 26549 y).

NEW COMPOUNDS



Aloeemodin-1 or 8-glucoside

R = H/Glu, R' = CH₂OH, R'' = H

Chrysophanol-1 or 8-glucoside

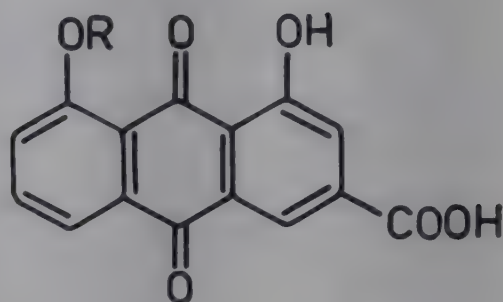
R = H/Glu, R' = Me, R'' = H

Physcion-1 or 8-glucoside

R = H/Glu, R' = OMe, R'' = Me

Rheumemodin-1 or 8-glucoside

R = H/Glu, R' = H, R'' = Me



Rhein

R = H

Rhein-8-glucoside

R = Glu

RHODIOLA (Crassulaceae)

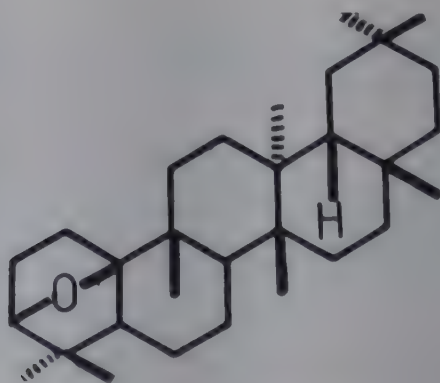
R. wallichiana (Hook.) Fu; see *Sedum wallichianum* Hook.

RHODODENDRON (Ericaceae)

R. arboreum Sm. syn. *R. nilagiricum* Zenk., *R. cinnamomeum* Wall. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 231).

Ursolic acid, epifriedelinol, friedelin, hyperin and quercetin isolated from leaves along with an unidentified compound, mp. 76° (*Proc. Indian Acad. Sci.* 1959, 50A, 366; *ibid.* 1961, 54A, 99; *J. Proc. Inst. Chemists*, Calcutta 1967, 39, 165; *Chem. Abstr.* 1968, 68, 19539 h); a quercetin rhamnoside, mp. 180°, from flowers (*Proc. Indian Acad. Sci.* 1960, 51A, 322); taraxerol, ursolic acid and betulinic acid from bark (*Curr. Sci.* 1966, 35, 390); campanulin, mp. 206° and α-amyrin from leaves (*J. Proc. Inst. Chemists*, Calcutta 1967, 39, 165; *Chem. Abstr.* 1968, 68, 19539 h); crystal structure of campanulin (*Acta. Crystallog.* Sec. B 1977, 33, 641).

NEW COMPOUNDS



Campanulin

R. barbatum Wall. ex G. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID,

New Delhi, 1956, p. 213).

Epifriedelinol, mp. 273°, isolated (*J. Proc. Inst. Chemists*, Calcutta, 1967, 39, 165; *Chem. Abstr.* 1968, 68, 19539 h).

R. campanulatum D. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 213).

Campanulin, epifriedelinol, ursolic acid, quercetin and minor constituents, mp. 74°, 168°, 284° and 272°, isolated from leaves along with friedelin and α -amyrin (*Proc. Indian Acad. Sci.* 1961, 53A, 98; *J. Proc. Inst. Chemists*, Calcutta 1967, 39, 165; *Chem. Abstr.* 1968, 68, 19539 h).

R. cinnabarinum Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 213).

Ursolic acid, quercetin and minor constituents, mp. 238° and 118°, from leaves (*Proc. Indian Acad. Sci.* 1962, 56A, 239).

R. cinnamomeum Wall.; see *R. arboreum* Sm.

R. falconeri Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 213).

α -Amyrin, campanulin and friedelin isolated from leaves (*J. Proc. Inst. Chemists*, Calcutta 1967, 39, 165; *Chem. Abstr.* 1968, 68, 19539 h).

R. formosum Wall.

New triterpenoids and a proanthocyanidin composed of leucocyanidin and epicatechin isolated from leaves along with dihydrotaraxerone, ursolic acid and taxifolin, mp. 232° (*Curr. Sci.* 1968, 37, 61).

Distribution : Bhutan and Khasi Hills, alt. 900-1500 m.

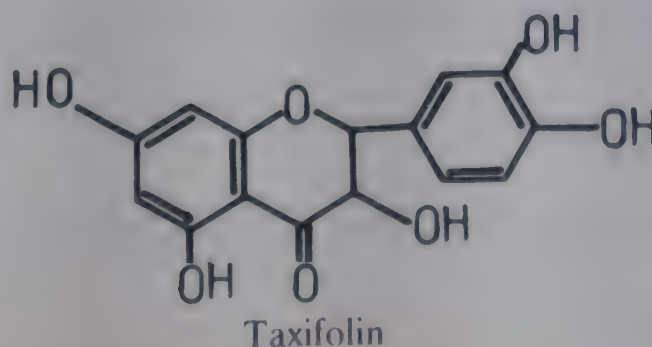
R. grande Wight

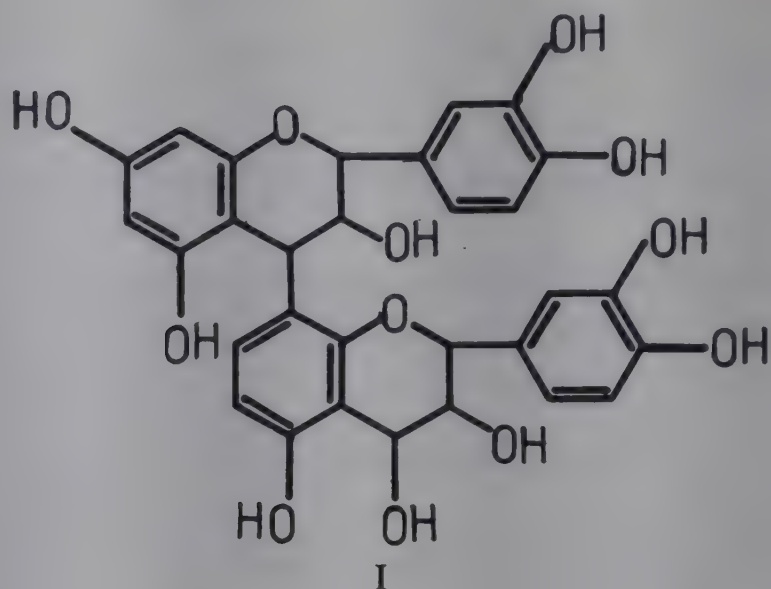
Nep. - Kali guraras, Patu korlinga; Lepcha-Etok amal.

Campanulin, friedelin and ursolic acid from leaves; quercetin and a neutral compound, mp. 204°, isolated after acid hydrolysis of extractive of leaves (*Proc. Indian Acad. Sci.* 1965, 62A, 224); dihydroflavonol - taxifolin - and a proanthocyanidin, mp. 265° (I) from bark (*Proc. Indian Acad. Sci.* 1966, 64A, 185); taraxeryl acetate, friedelin, taraxerol, β -sitosterol and betulinic acid from bark (*J. Indian Chem. Soc.* 1969, 46, 379).

Distribution : East Nepal to Bhutan and Arunachal Pradesh, alt. 1800-3300 m.

NEW COMPOUNDS





R. nilagiricum Zenk.; see *R. arboreum* Sm.

R. vaccinioides Hook.f.

Friedelin, campanulin, ursolic acid and leucocyanidin from leaves (*Curr. Sci.* 1966, 35, 618).

Distribution : East Nepal to north-eastern India, alt. 1800-2400 m.

R. veitchianum Hook.

Ursolic acid, quercetin and new triterpenoids, mp. 210° and 224°, isolated from leaves (*Curr. Sci.* 1966, 35, 564).

Distribution : Lushai Hills and Mizoram. Reported to have been introduced in Nilgiris.

RHUS (Anacardiaceae)

R. chinensis Mill.; see *R. javanicus* L.

R. cotinus L.; see *Cotinus coggia* Scop.

R. javanicus L. syn. *R. chinensis* Mill., *R. semialata* Murr. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 213).

A gallic acid ester, mp. 191° and quercitrin from leaves (*Yakugaku Zasshi* 1964, 84, 894; *Chem. Abstr.* 1965, 62, 821 e).

R. semialata Murr.; see *R. javanicus* L.

R. succedanea L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 214).

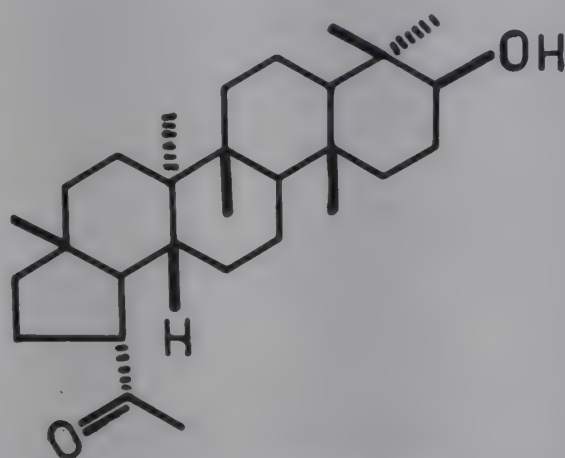
Succedaenins A and B isolated from fruits (*J. Sci. Res., Banaras Hindu Univ.* 1957, 8, 1; *Chem. Abstr.* 1960, 54, 1472 f).

RICINUS (Euphorbiaceae)

R. communis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 214).

Lysine-2-C¹⁴, fed hydroponically to seedlings, was incorporated in ricinine solely in α -position to ring N atom; yield of ricinine about 1% from plant (*J. Chem. Soc.* 1959, 2921); detection of palmitic (1.2), stearic (0.7), arachidic (0.3), hexadecenoic (0.2), oleic (3.2), linoleic (3.4), linolenic (0.2), ricinoleic (89.4%) and dihydroxystearic acids as Me esters in castor oil by GLC (*J. Am. Oil Chemists Soc.* 1964, 41, 783; *Chem. Abstr.* 1965, 62, 4227 h); lupeol and 30-norlupan-3 β -ol-20-one from coat of castor bean (*Phytochemistry* 1968, 7, 845).

NEW COMPOUNDS



30-Norlupan-3 β -ol-20-one

RIVEA (Convolvulaceae)

R. corymbosa Haill. f.; see *Tubina corymbosa* (L.) Rafin.

ROBINIA (Papilionaceae)

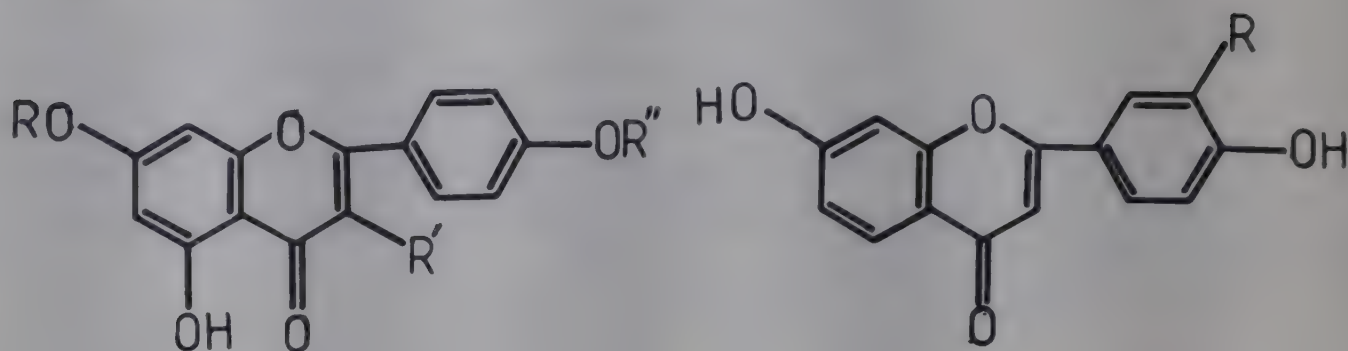
R. pseudoacacia L.

Eng. - Robinia, False acacia, Black locust.

2,4-Dihydroxybenzoic acid, its methyl, 1-(4-hydroxycinnamoyl) and 1-(3,4,5-trihydroxycinnamoyl) esters, liquiritigenin, butein, butin, robinetin and dihydrorobinetin from heartwood (*Nippon Kagaku Zasshi* 1966, 87, 1201; *Chem. Abstr.* 1967, 66, 94951 y); acaciin, mp. 275°, acacetin trioside, two unidentified compounds from leaves along with two apigenin glycosides, mp. 257° and 196°, whose sugar moieties were rhamnose and xylose, and rhamnose, xylose and glucose respectively (*Nippon Kagaku Zasshi* 1966, 87, 1206; *Chem. Abstr.* 1967, 66, 104872 g); biorobin, mp. 221° and bioquercetin from unripe fruits; latter characterised as quercetin-3-O-(β -D-galactofuranosyl)-L-rhamnopyranoside (*Khim. Pri. Soedin.* 1967, 3, 226; *Chem. Abstr.* 1968, 68, 22200 w); acaciin was identical with linarin [5,7-dihydroxy-4'-methoxyflavanone-7-(6-O- α -L-rhamnopyranosyl)- β -D-glucopyranoside] (*Chem. Ber.* 1969, 102, 1445); robinin isolated (*Fenol'nye Soedin. Ikh. Biol. Funkts. Mater. Vses. Simp. Ist* 1966, 60 (pub. 1968); *Chem. Abstr.* 1969, 71, 13325 a).

Distribution : Native of U.S.A., introduced into India as ornamental tree in gardens.

NFW COMPOUNDS



Acaciin

R = Glu(6→1)Rha, R' = H, R'' = Me

Robinin

R = Rha, R' = Gal(6→1)Rha, R'' = H

Liquiritigenin

R = H

Butin

R = OH

ROCCELLA (Roccelaceae)

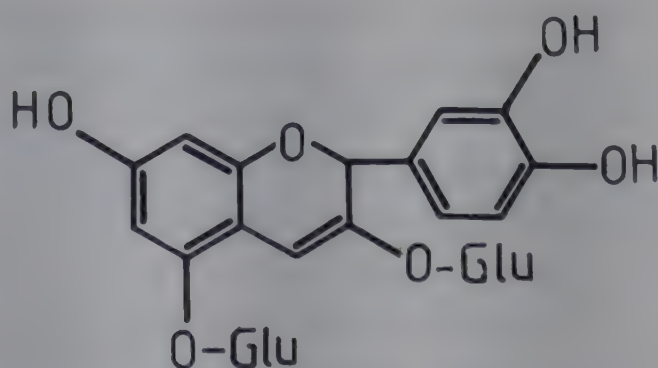
R. montagnei Bel. β -Carotene and γ -carotene isolated (*J. Sci. Ind. Res.* 1959, 18B, 162).

Distribution : Karnataka and coastal regions of Orissa, Andhra Pradesh and Pondicherry.

ROSA (Rosaceae)

R. damascena Mill. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 215).Quercetin, kaempferol and cyanidin from whole plant (*Rasteniev'd Nauki* 1967, 4, 19; *Chem. Abstr.* 1968, 68, 75745 j); cyanidin-3,5-diglucoside from petals (*Chem. Ind.* 1967, 954).

NEW COMPOUNDS



Cyanidin-3,5-diglucoside

R. multiflora Thunb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 215).Astragalin, mp. 213°, identified as kaempferol monoglucoside (*Yakugaku Zasshi* 1962, 82, 771; *Chem. Abstr.* 1962, 57, 7384 g).

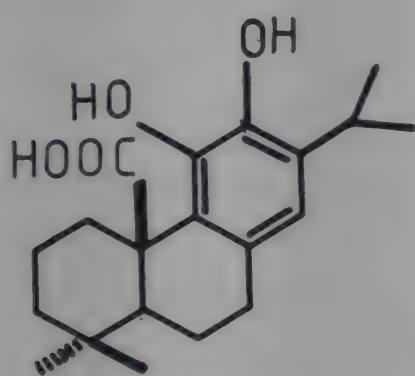
ROSMARINUS (Lamiaceae)

R. officinalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi,

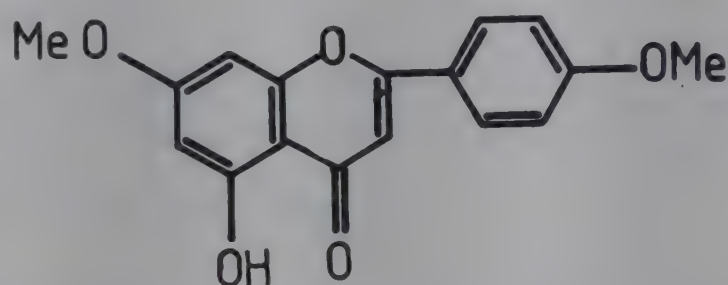
1956, p. 215).

Rosamaricine (0.33%) mp. 199° dec. along with another base, mp. 197°, isolated from leaves and branches (*Zh. Obshch. Khim.* 1962, 32, 1337; *Chem. Abstr.* 1963, 58, 2477 e; *Khim. Pri. Soedin.* 1967, 3, 140; *Chem. Abstr.* 1967, 67, 64618 y); carnosic acid isolated and characterised (*J. Org. Chem.* 1965, 30, 2931); 5-hydroxy-4',7-dimethoxyflavone, mp. 178°, from leaves (*Arch. Pharm.* 1967, 300, 1042; *Chem. Abstr.* 1968, 68, 66337 a; *Tetrahedron Lett.* 1968, 3447); borneol, bornyl acetate, camphor, cineole and α -pinene from essential oil (*J. Pharm. Sci. U.A.R.* 1965, 6, 137; *Chem. Abstr.* 1967, 67, 84753 s); 4',5-dihydroxy-7-methoxyflavone (I) and a 6-methoxyluteolin glycoside, mp. 252° dec., isolated from leaves (*Tetrahedron Lett.* 1968, 3447).

NEW COMPOUNDS



Carnosic acid



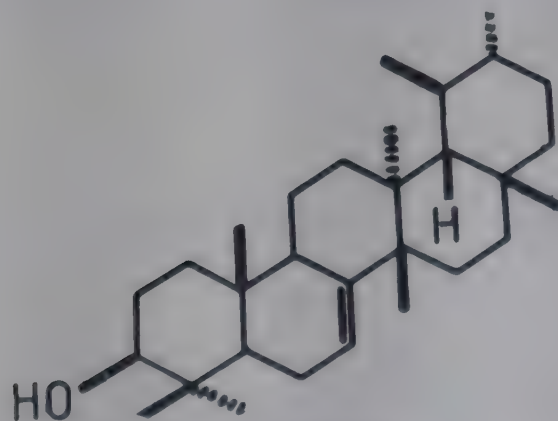
I

ROTULA (Boraginaceae)

R. aquatica Lour. syn. *Rhabdia lycioides* Mart. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 215).

Bauerenol, mp. 282°, α - and β -amyrin isolated (*Curr. Sci.* 1969, 38, 89).

NEW COMPOUNDS



Bauerenol

RUBIA (Rubiaceae)

R. tinctorum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 215).

An anthracene derivative isolated from rhizome (*Biul. Inst. Roslin Lecznichych* 1964, 10, 6;

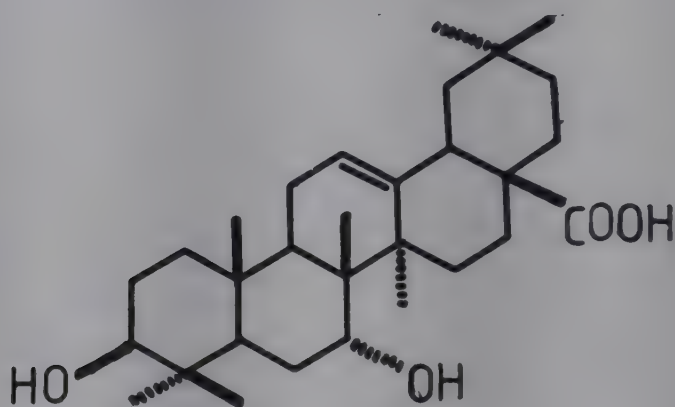
Chem. Abstr. 1965, 62, 8115 a).

RUBUS (Rosaceae)

R. moluccanus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 216).

New triterpene - rubusic acid - characterised as 3 β ,7 α -dihydroxy-olean-12-en-28-oic acid (*J. Indian Chem. Soc.* 1969, 46, 381).

NEW COMPOUNDS



Rubusic acid

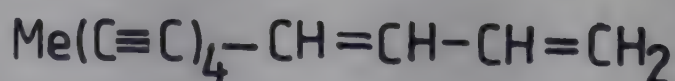
RUDBECKIA (Asteraceae)

R. bicolor Nutt.

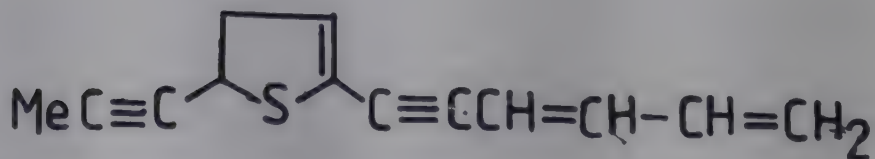
Polyacetylenic compounds I, II and III from roots (*Chem. Ber.* 1965, 98, 3081).

Distribution : Grown in gardens.

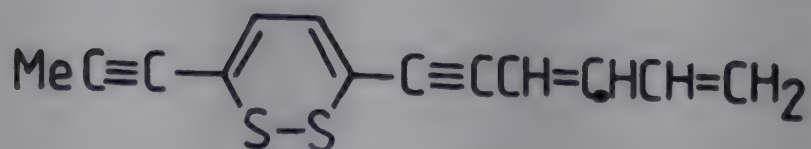
NEW COMPOUNDS



I



II



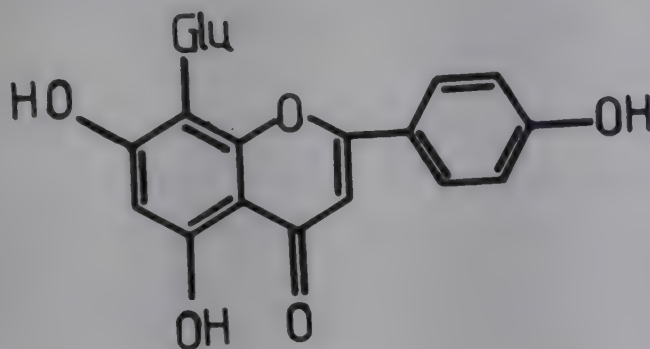
III

RUMEX (Polygonaceae)

R. acetosa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 216).

Quercetin and quercetin-3-D-galactoside from fruits (*Byul. Gl. Bot. Sada* 1964, 57; *Chem. Abstr.* 1965, 63, 8727 g); vitexin, mp. 253°, from leaves (*Chem. Pharm. Bull.* 1965, 13, 1470).

NEW COMPOUNDS



Vitexin

R. conglomeratus Murr.

Pharmacognosy and determination of hydroxymethyl anthraquinones; effect of decoction of plant on intestine of rabbits and guinea pigs reported (*Farmacia* 1959, 7, 361; *Chem. Abstr.* 1960, 54, 12485 h).

Distribution : Jammu and Kashmir State.

R. maritimus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 216).

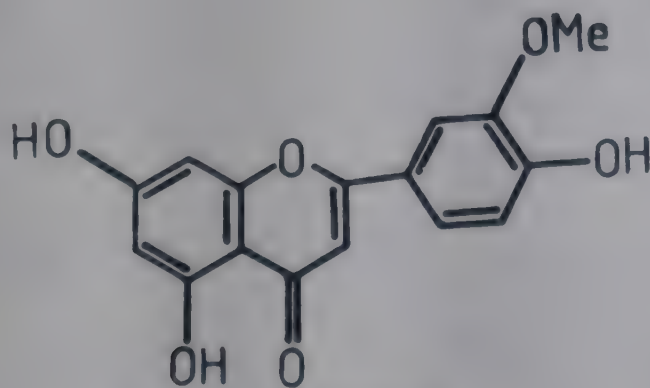
Rumarain, mp. 252°, rutin and hyperin from fruits (*Khim. Prir. Soedin.* 1966, 2, 85; *Chem. Abstr.* 1966, 65, 15489 h).

RUNGIA (Acanthaceae)

R. repens (L.) Nees (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 217).

Luteolin-7-glucoside (0.5%), mp. 250° and delphinidin from flowers (*Indian J. Chem.* 1964, 2, 238); besides luteolin, another flavone - chrysoeriol - isolated from flowers (*Indian J. Chem.* 1966, 4, 461).

NEW COMPOUNDS



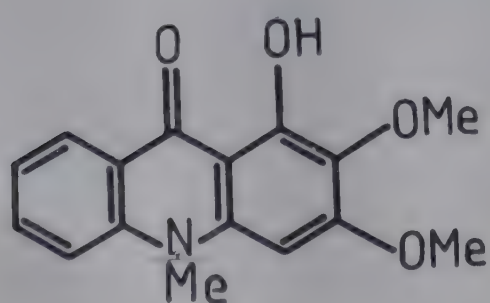
Chrysoeriol

RUTA (Rutaceae)

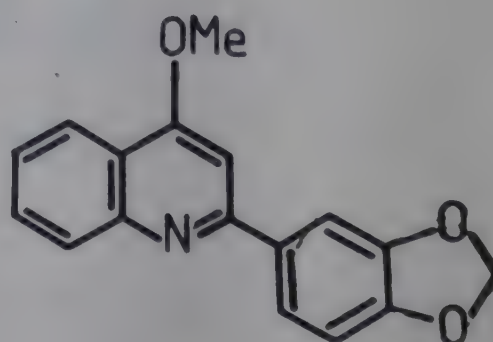
R. graveolens L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 217).

Alcoholic extract showed spasmolytic properties (*Acta Pharm. Hung.* 1967, 37, 131; *Chem. Abstr.* 1967, 67, 25374 w).

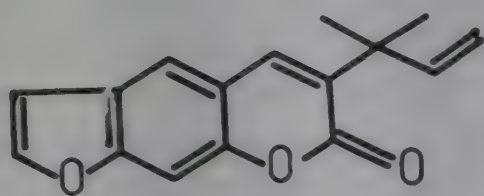
Kokusaginine (0.05) and skimmianine (0.06%) isolated from different parts of plant and their structures determined (*Aust. J. Chem.* 1960, 13, 510; *Chem. Pharm. Bull.* 1960, 8, 377; *Chem. Ind.* 1962, 1982; *Planta Med.* 1965, 13, 425; *ibid.* 1967, 15, 132; *Pharmazie* 1968, 23, 520; *Chem. Abstr.* 1969, 70, 60723 f); other alkaloids isolated from plant and characterised - graveoline, mp. 205° (*Aust. J. Chem.* 1960, 13, 510); graveolinine (0.002%), mp. 115° (*Chem. Ind.* 1962, 1982); 2,3-dihydrokokusaginine, mp. 173° (*Chem. Pharm. Bull.* 1960, 8, 377); γ -fagarine, dictamnine, arborine and arborinine (*Naturwiss.* 1965, 52, 347; *Chem. Abstr.* 1965, 63, 7348 e; *Planta Med.* 1965, 13, 425; *ibid.* 1967, 15, 132; *Pharmazie* 1968, 23, 520; *Chem. Abstr.* 1969, 70, 60763 f); rutamine, mp. 187° isolated (*Arch. Pharm.* 1967, 300, 953; *Chem. Abstr.* 1968, 68, 49833 s); structure of rutacridone, mp. 161° (*Acta Pharm. Suec.* 1967, 4, 265; *Chem. Abstr.* 1968, 68, 39860 j); another alkaloid characterised as 2-[4-(3,4-methylenedioxyphenyl)-butyl]-4-quinolone (I), mp. 224° (*Naturwiss.* 1967, 54, 517; *Chem. Abstr.* 1968, 68, 39860 j); ribalinium and two other quaternary alkaloids isolated as chlorides, mp. 246° and 108°, from leaves (*Pharmazie* 1968, 23, 519; *Chem. Abstr.* 1969, 70, 60761 d); three new alkaloids isolated; structure of one established as isopropylidihydroxyfuroquinoline (*Acta Pharm. Hung.* 1969, 39, 60; *Chem. Abstr.* 1969, 71, 64052 s); bergapten (0.05%), xanthotoxin and an aliphatic ketone, mp. 62° (*Chem. Pharm. Bull.* 1960, 8, 377; *Chem. Abstr.* 1961, 55, 15528 d; *Pharmazie* 1965, 20, 456; *Chem. Abstr.* 1965, 63, 13703 g; *Pharmazie* 1965, 20, 738; *Chem. Abstr.* 1966, 64, 6404 b; *Naturwiss.* 1965, 52, 263; *Chem. Abstr.* 1965, 63, 6017 g; *Acta Pharm. Hung.* 1967, 37, 131; *Chem. Abstr.* 1967, 67, 25374 w); rutin, isoimperatorin and psoralen isolated from different parts of plant (*Pharmazie* 1966, 21, 628; *Chem. Abstr.* 1967, 66, 58819 c; *Acta Pharm. Hung.* 1967, 37, 131; *Chem. Abstr.* 1967, 67, 25374 w); a furocoumarin- β -D-glucopyranoside - rutarin, mp. 143° (*Arch. Pharm.* 1967, 300, 913; *Chem. Abstr.* 1968, 68, 489975 q); a new furocoumarin - rutaretin - characterised as (-)-6,7-dihydroxy-7-(1-hydroxy-1-methylethyl)-9-hydroxyfuro(2,3-q)coumarin (*Arch. Pharm.* 1967, 300, 73; *Chem. Abstr.* 1967, 66, 115621 h); daphnoretin and its Me ether from aerial parts (*Planta Med.* 1968, 16, 372); isolation of chalepensis, graveliferon Me ether and 3-(1,1-dimethylallyl)herniarin from roots (*Tetrahedron Lett.* 1968, 4395).

NEW COMPOUNDS

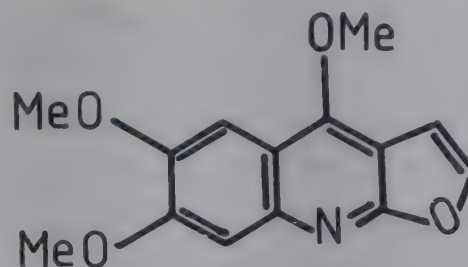
Arborinine



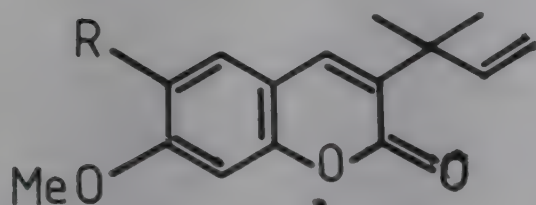
Graveolinine



Chalepensisin



Kokusaginine

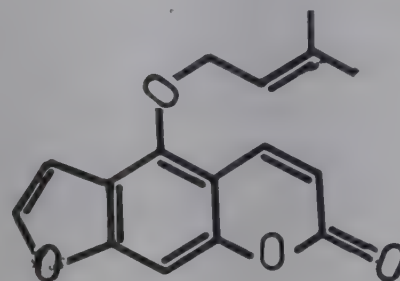


Gravelliferon Me ether

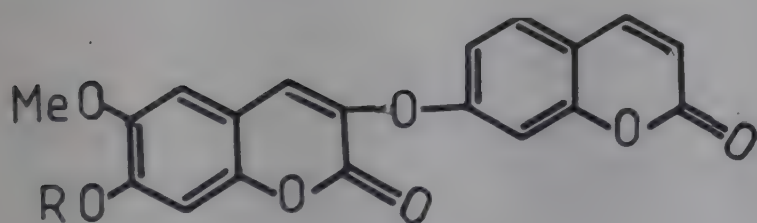
R = 2-Pentenyl

3-(1,1-Dimethylallyl)herniarin

R = H



Isoimperatorin

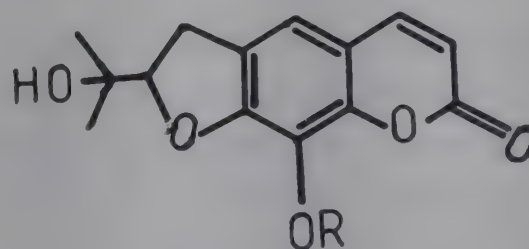


Daphnoretin

R = H

Daphnoretin Me ether

R = Me

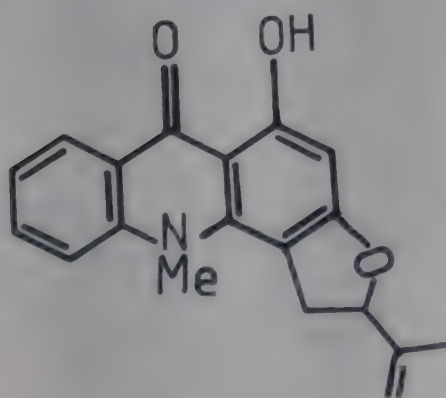


Rutaretin

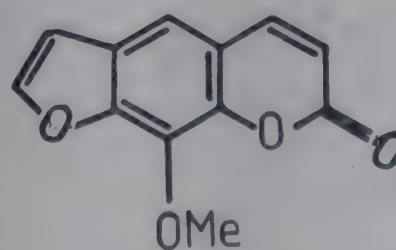
R = H

Rutarin

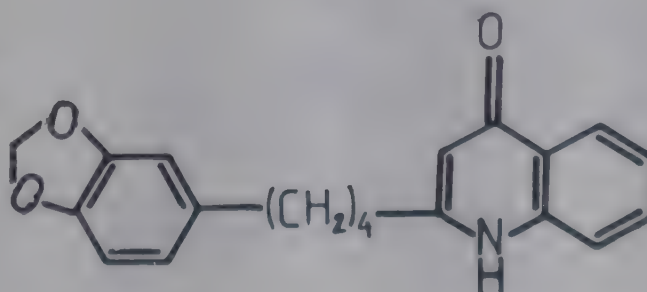
R = Glu



Rutacridone



Xanthotoxin



I

BIOLOGICAL ACTIVITY

Addition of rutin (10 mg - 1 μ g dilns.) to tissue slices did not influence oxygen consumption,

phosphate uptake and phosphate/oxygen ratio, while vitamin P at 100 mg and 10 mg dilns. increased amount of oxygen consumed by 272 and 90% respectively; vitamin P in lower concentration did not affect the rate of respiration. Catechol complex promoted oxygen uptake and diminished phosphate uptake by liver slices at higher concentration apparently due to its high autooxidation properties (*Izv. Akad. Nauk. Est. SSR Ser. Biol.* 1962, 11, 41; *Chem. Abstr.* 1963, 58, 7259 h). Bergapten, xanthotoxin and essential oil showed spasmolytic activity (*Planta Med.* 1965, 13, 226). Compound, mp. 130°, showed spasmolytic activity (*Naturwiss.* 1965, 52, 14; *Chem. Abstr.* 1965, 62, 9460 g).

Ribalinium showed ganglion-blocking and curare-like activity (*Pharmazie* 1968, 23, 519; *Chem. Abstr.* 1969, 70, 60761 d). Dictamnine, γ -fagarine, skimmianine, kokusaginine, arborinine and graveolinine showed spasmolytic activity in rat, guinea pig and rabbit ileum; first four alkaloids had LD50 values in the range of 150-250 and graveolinine 45 mg/kg in mice (*Planta Med.* 1967, 15, 132; *Sci. Pharm., Proc.*, 25th 1965, (Pub. 1966) 2, 559; *Chem. Abstr.* 1969, 70, 18805 w).

SALACIA (Celastraceae)

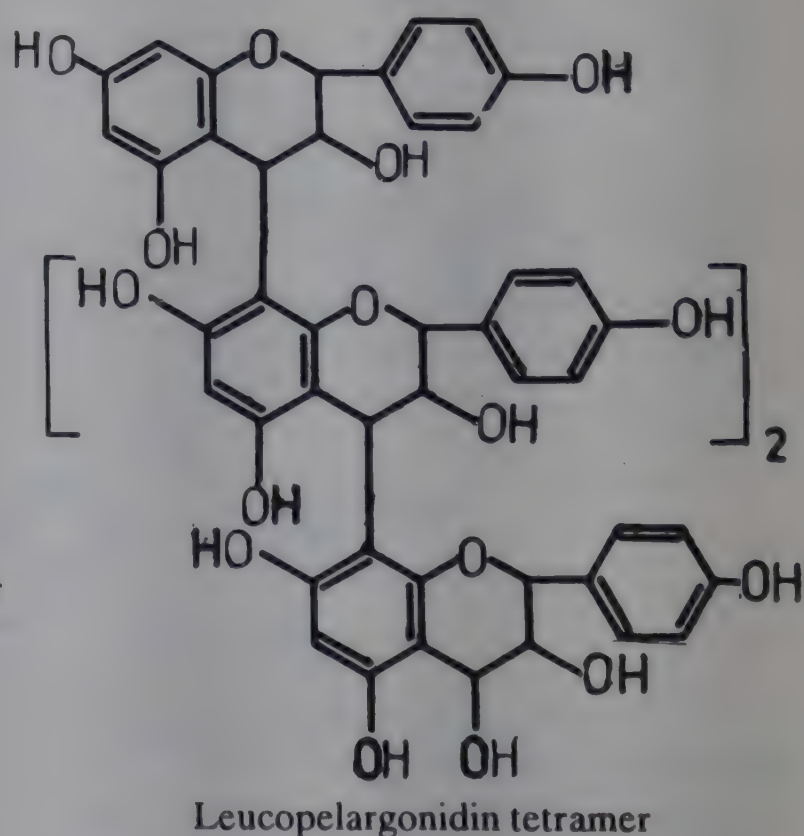
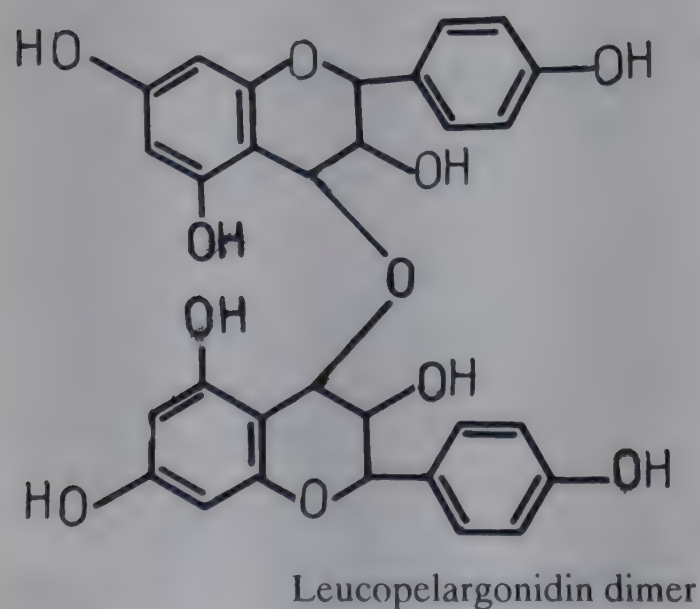
S. chinensis L. syn. *S. prinoides* DC.; *S. latifolia* Wall. ex Laws.

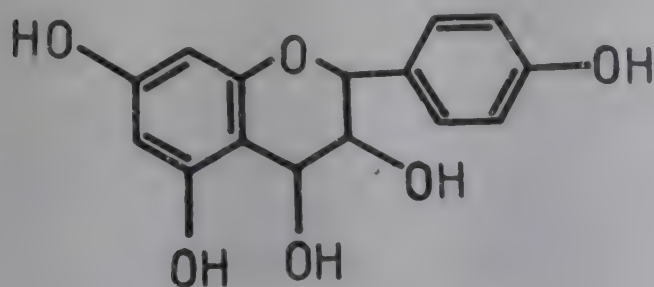
Mar. - Ingli, Nishul - bondi; Mal. - Cherukuranti; Trade - Saptrangi.

Roots and stems reputed as oral antidiabetic. Leucopelargonidin, mp. 220°, its dimer, mp. 180° and tetramer isolated from stems and roots (*Tetrahedron Lett.* 1967, 2441); dulcitol, gutta (a linear isomer of natural rubber), mp. 57° and dimer of leucopelargonidin from stems; latter two also from leaves (*Curr. Sci.* 1967, 36, 596).

Distribution : Eastern and western Peninsula, Meghalaya and Andaman Islands.

NEW COMPOUNDS





Leucopelargonidin

S. latifolia Wall. ex Laws.; see *S. chinensis* L.

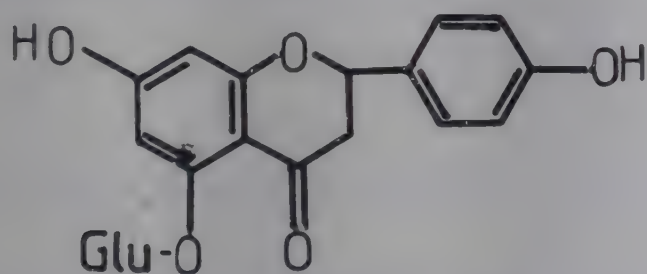
S. prinoides DC.; see *S. chinensis* L.

SALIX (Salicaceae)

S. acutifolia Willd. syn. *S. daphnoides* auct. (non Vill.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 218).

Naringenin-5-glucoside, mp. 158° and chalconaringenin-2'-glucoside from bark (*Vestnik Akad. Nauk. SSSR, Ser. Khim. Nauk* 1969, 72; *Chem. Abstr.* 1969, 71, 73989 e).

NEW COMPOUNDS

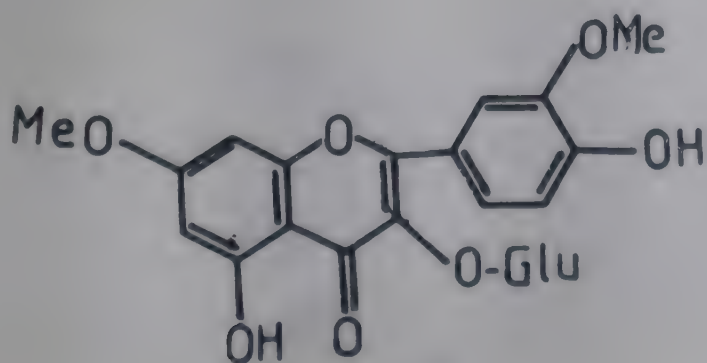


Naringenin-5-glucoside

S. alba L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 218).

4-O-Methyl-D-glucuronoxylan isolated from wood, comprising of 120 D-xylopyranose units linked together by 1→4 glycosidic bonds, every eleventh unit carrying 4-O-methyl-D-glucuronic acid or D-glucuronic acid on its C-2 atom (*Collect. Czech. Chem. Commun.* 1967, 32, 3597); a new flavonol glucoside - alboside, mp. 178° - isolated from leaves and characterised as rhamnazine-3-β-D-glucoside (*Tetrahedron Lett.* 1968, 2301).

NEW COMPOUNDS



Alboside

S. daphnoides Vill.; see *S. acutifolia* Willd.

S. viminalis L.

P. - Bibsu; Himachal Pradesh - Kumanta

Tannins, monosaccharides, oligosaccharides and organic acids from bark (*Kozhi Obuvki* 1964, 5, 1; *Chem. Abstr.* 1965, 63, 6017 e); (+)abscisin II and (+)dormin isolated from phloem exudate (*Life Sci.* 1967, 6, 1113; *Chem. Abstr.* 1967, 67, 29860 z).

Distribution : Himalayas from Kashmir to Sikkim, alt. 1500 - 2700 m.

SAMALIA (Bombacaceae)

S. malabarica Schott & Endl.; see *Bombax ceiba* L.

SALVADORA (Salvadoraceae)

S. oleoides Decne. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 219).

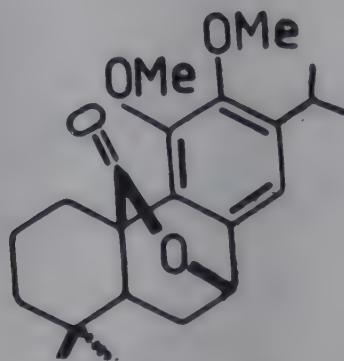
A sterol glucoside, benzyl isothiocyanate, a neutral compound, n-octacosanol, β -sitosterol and tetracosane from fruits (*Indian Oil Seeds J.* 1964, 8, 289; *Chem. Abstr.* 1965, 62, 9458 c); sym. dibenzylurea and sym. dibenzylthiourea identified in nonsaponifiable portion of oil from seeds (*Curr. Sci.* 1968, 37, 121).

SALVIA (Lamiaceae)

S. officinalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 219).

Bitter aromatic diterpene - picrosalvin, mp. 221° - isolated from leaves; bitter value 1:14000; structure proposed (*Deut. Apoth.- Ztg.* 1958, 98, 651; *Chem. Abstr.* 1961, 55, 6786 b; *Chem. Ber.* 1962, 95, 3034; *Helv. Chim. Acta* 1964, 47, 1234; *Tetrahedron Lett.* 1965, 3647; essential oil and tannin contents of plant investigated (*Acta Pol. Pharm.* 1963, 20, 269; *Chem. Abstr.* 1965, 62, 1509 f); 3-methyl-3-methylene-5-heptene and farnesene from essential oil by GLC (*Deut. Apoth.-Ztg.* 1964, 104, 1388; *Chem. Abstr.* 1965, 62, 2664 c); α -amyrin, β -amyrin, β -sitosterol and its glucoside and a trihydroxytriterpene, mp. 199° , from seeds (*Arch. Pharm.* 1964, 297, 456; *Chem. Abstr.* 1964, 61, 11002 c); seeds contained nitrogen (2.87%) and a water-soluble protein (*Pharmazie* 1965, 20, 392; *Chem. Abstr.* 1965, 63, 8731 a).

NEW COMPOUNDS

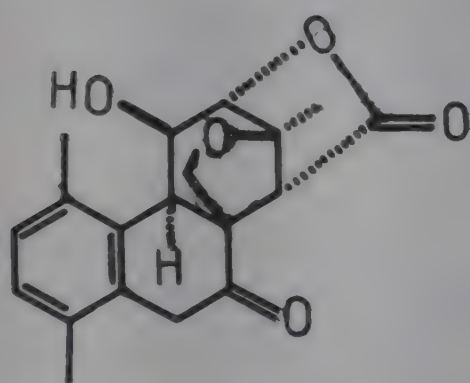


Picrosalvin

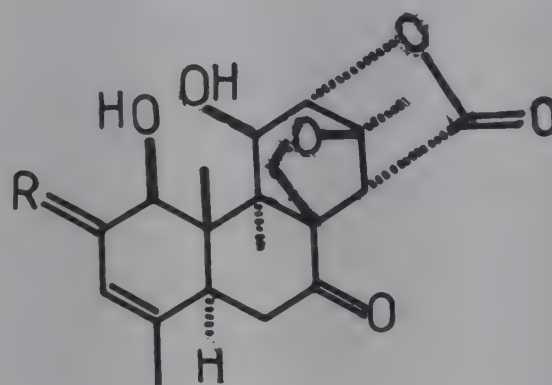
SAMADERA (Simaroubaceae)

S. indica Gaertn. syn. *S. lucida* Wall., *Quassia indica* (Gaertn.) Nooteb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 220).

Taraxerone, stigmastanone, stigmasterol, 2,6-dimethoxybenzoquinone, samaderine A, samaderine B, mp. 235° and samaderine C, mp. 265°, from bark (*Bull. Soc. Chim. Fr.* 1962, 1715; *Chem. Abstr.* 1963, 58, 6888 h); structures of samaderine B, samaderine C and samaderol confirmed (*Bull. Soc. Chim. Fr.* 1964, 2016; *Chem. Abstr.* 1965, 62, 11755 f); besides lupenone, a new compound - 18 α -oleanan-19 α -ol-3-one (I) - isolated (*J. Org. Chem.* 1965, 30, 2847).

NEW COMPOUNDS

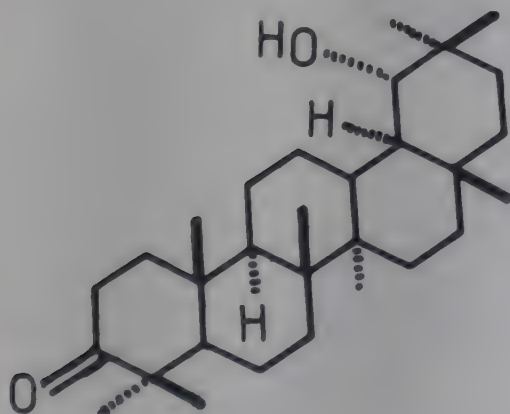
Samaderol



Samaderine B

R = O

Samaderine C

R = β -OH, H

I

S. lucida Wall.; see *S. indica* Gaertn.

SAMBUCUS (Caprifoliaceae)

S. nigra L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 220).

Glucose esters - 1-caffeoyl- β -D-glucoside and 1-feruloyl- β -D-glucoside - along with another glucoside of caffeic acid identified by PC (*Z. Chem.* 1962, 2, 373; *Chem. Abstr.* 1963, 58, 8237 e); α -amyrenone, α -amyrin, betulin, oleanolic acid and β -sitosterol from bark (*Phytochemistry* 1964, 3, 297); besides these, ursolic acid, ceryl alcohol and n-heptacosane from bark (*Chem. Ber.* 1965, 98, 120).

SANTALUM (Santalaceae)

S. album L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 221).

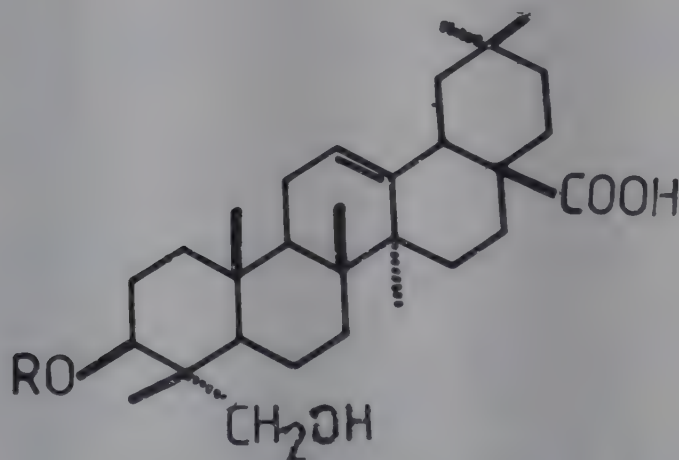
Preparation of L-allohydroxyproline in bulk from fruits (*Indian J. Chem.* 1963, 2, 88); betulinic acid (0.05%), β -sitosterol, glucose, fructose and sucrose from leaves (*Indian J. Chem.* 1964, 2, 82).

SAPINDUS (Sapindaceae)

S. emarginatus Vahl. syn. *S. trifoliatu*s sensu Hook.f., p.p. (non L.)

A new saponin - emarginatoside, mp. 210° - from fruits; its acid hydrolysis yielded hederagenin, rhamnose, xylose and glucose (*Indian J. Chem.* 1966, 4, 149).

Distribution : Andhra Pradesh, Karanataka, Maharashtra, Tamil Nadu, Bihar, Orissa and West Bengal.

NEW COMPOUNDS

Emarginatoside

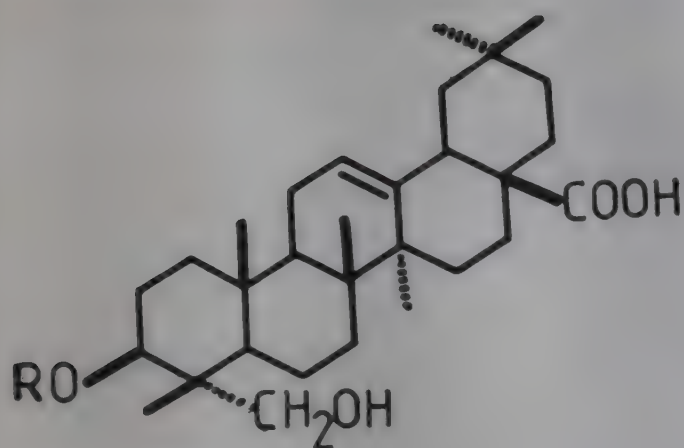
R = Rha + Xyl + Glu

S. laurifolia Vahl.; see *S. trifoliatu*s L.

S. mukorossi Gaertn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 221).

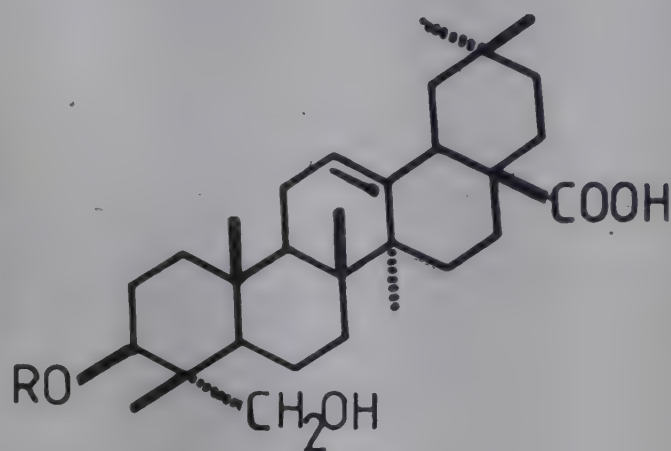
Sapindoside V, mp. 107° and sapindosides A and B isolated which had hederagenin as common aglycone; sapindoside V contained fructose, arabinose and rhamnose and sapindoside B contained arabinose and glucuronic acid (*Farm. Zh.* 1965, 20, 27; *Chem. Abstr.* 1966, 64, 5443 f); mukorosside, mp. 155° , isolated from fruits (*Indian J. Chem.* 1966, 4, 36).

NEW COMPOUNDS



Mukorosside

R = Rha + Ara + Xyl + Glu



Sapindoside V

R = Fru + Ara + Rha + Rha

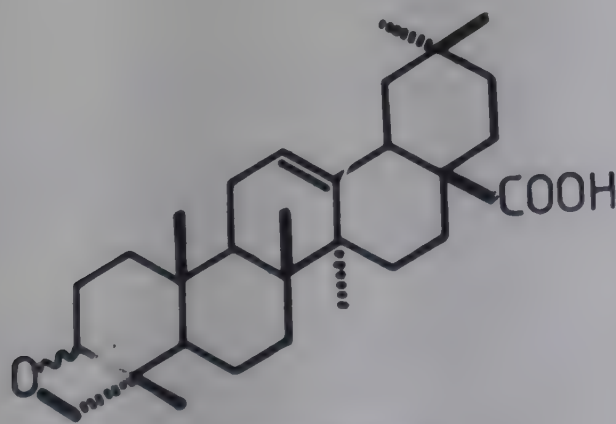
Sapindoside B

R = Ara + Gluc.acid + Gluc.acid

S. trifoliatum L. syn. *S. trifoliatum* sensu Hook.f., p.p., *S. laurifolia* Vahl. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 221).

Saponin from defatted pericarp hydrolysed to give hederagenin and oleanolic and sapindic acids (*Experientia* 1968, 24, 1091).

NEW COMPOUNDS



Sapindic acid

SAPIUM (Euphorbiaceae)

S. baccatum Roxb.

Assam - Admasali, Seleng, Lawa; Khasi - Dieng-ja-long-ehr; Garo - Samsim; Andamaus - Lelum

Taraxerone, taraxerol, 1-hexacosanol and β -sitosterol isolated (*J. Indian Chem. Soc.* 1969, 46, 663).

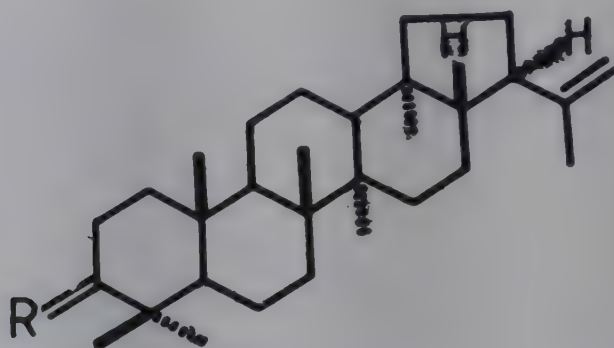
Distribution : Sikkim, Assam, Khasi Hills, Manipur, Western Ghats and Andaman Islands.

S. sebiferum (L.) Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 221).

Moretenone, moretenol and a new triterpene - 3-epimoretenol, mp. 223° - isolated from

bark (*Chem. Commun.* 1967, 1217; *Phytochemistry* 1968, 8, 331); friedelin, β -sitosterol, ellagic acid and stigmasterol from leaves and stem (*Phytochemistry* 1968, 8, 331).

NEW COMPOUNDS



Moretenone

R = O

Moretenol

R = H, β -OH

3-Epimoretenol

R = H, α -OH

SARCOCEPHALUS (Rubiaceae)

S. cordatus Miq.; see *Nauclea orientalis* (L.) L.

SARCOCOCCA (Buxaceae)

S. pruniformis Lindl.; see *S. saligna*-(D. Don) Muell.-Arg.

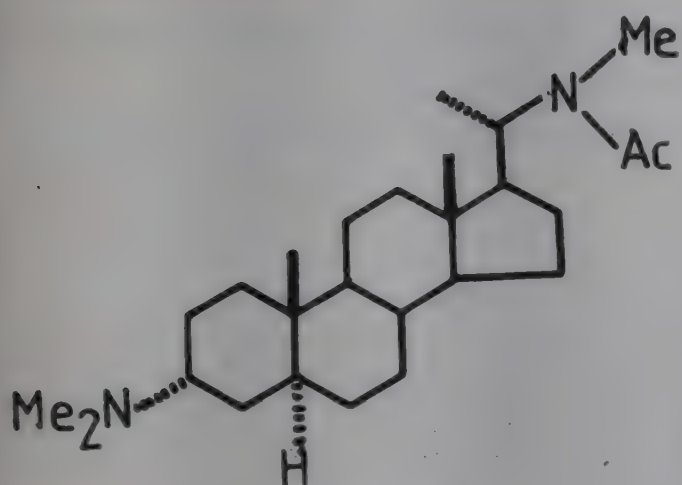
S. saligna (D. Don) Muell. - Arg. syn. *S. pruniformis* sensu Hook.f.,p.p. (non Lindl.)

Kumaon - Sukat sing; Garhwal - Paliala, Geru; Jaunsar - Tiliari; Khasi - Tiw-deng-pah; Nep. - Chikkath, Chiline.

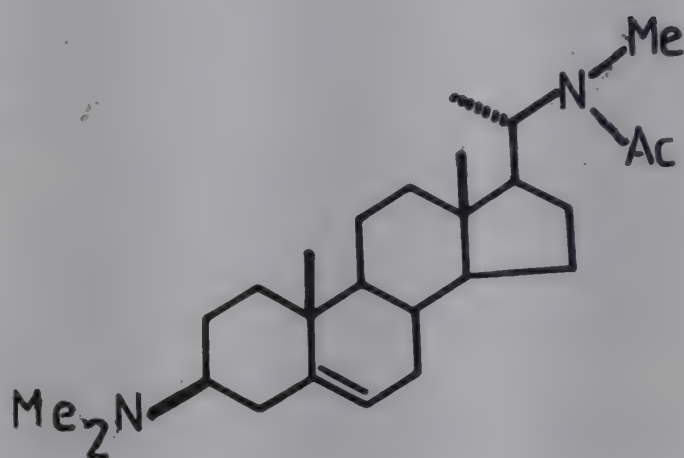
Isolation of alkaloids A (saracodine), mp. 245°, B (saracocine), mp. 235°, C, mp. 151°, along with an amorphous alkaloid, mp. 180°; alkaloids A and B characterised as 3 α -dimethylamino-20 α -methylacetylaminio)-5 α -pregnane and 3 α -dimethylamino-20 α -methylacetylaminio)-pregn-5-ene respectively (*Tetrahedron Lett.* 1964, 3309; *Tetrahedron* 1967, 23, 3829); saracodinine (kurchessine), mp. 136°, saracodine and saracocine from leaves (*Tetrahedron Lett.* 1965, 67); structure of saracodinine elucidated and a neutral compound identified as betulin (*J. Indian Chem. Soc.* 1966, 43, 285); two new alkaloids - salignine, mp. 229° and compound, mp. 136° - isolated from leaves (*Pakistan J. Sci. Ind. Res.* 1966, 9, 103; *Chem. Abstr.* 1967, 67, 22055 g); four steroidal alkaloids - A, mp. 148°, B, mp. 274°, C, mp. 144° and D, mp. 260° - isolated; structures of alkaloids A and B determined (*Chem. Ind.* 1966, 769).

Distribution : Himalayas from Kashmir to Bhutan, alt. 1500-2700 m, hills of north-eastern India alt. 1500-200 m and Western Ghats from Canara southwards.

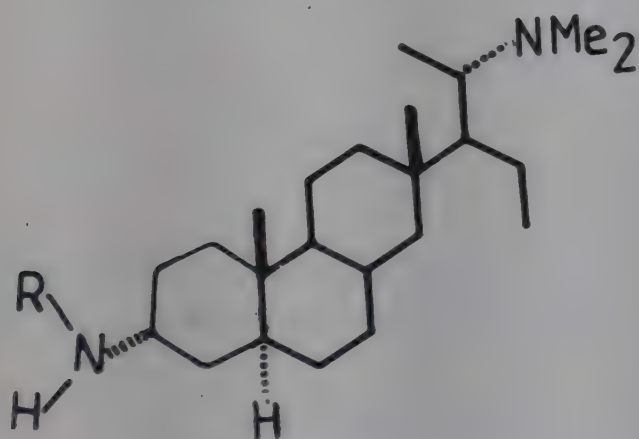
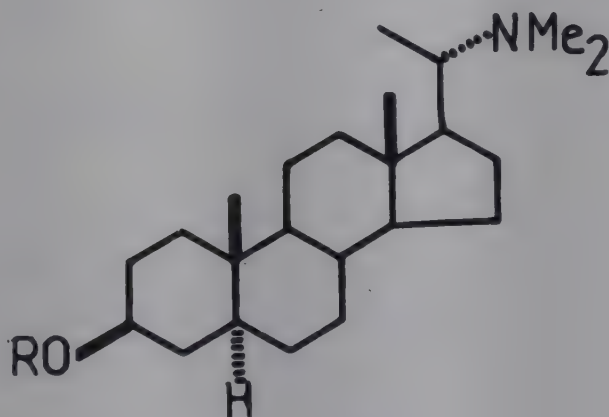
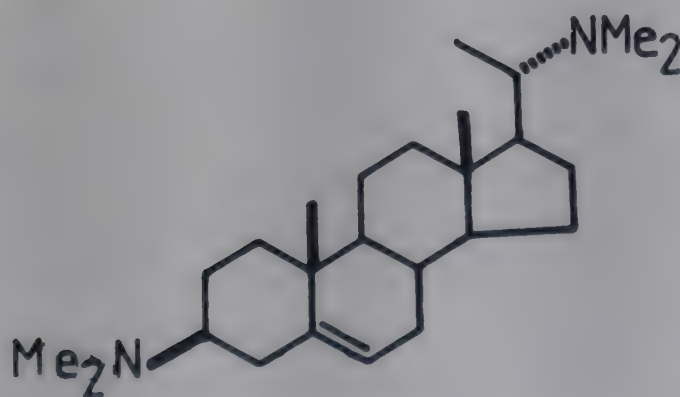
NEW COMPOUNDS



Saracodine



Saracocine

Alkaloid A
R = SenecierylAlkaloid B
R = Senecieryl

Saracodinine

SARCOSTEMMA (Asclepiadaceae)

S. acidum (Roxb.) Voigt syn. *S. brevistigma* W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 222).

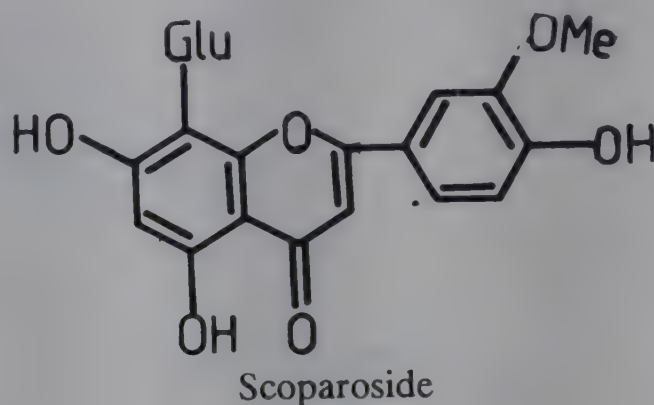
α -Amyrin acetate, lupeol acetate, β -amyrin acetate and β -sitosterol from twigs (*Indian J. Chem.* 1963, 1, 501).

S. brevistigma W. & A.; see *S. acidum* (Roxb.) Voigt

SAROTHAMNUS (Papilionaceae)

S. scoparius (L.) Wimm. ex W.D.J. Koch. syn. *Cytisus scoparius* (L.) Link (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 89).

Scoparoside (scoparin) was characterised as 8-monoglucosyl-3'-O-methyllyuteolin (C. R. Acad. Sci. Paris. Sec. D 1961, 252; 1659).

NEW COMPOUNDS**SAUSSUREA** (Asteraceae)

S. albescens Hook.f. & Thoms.

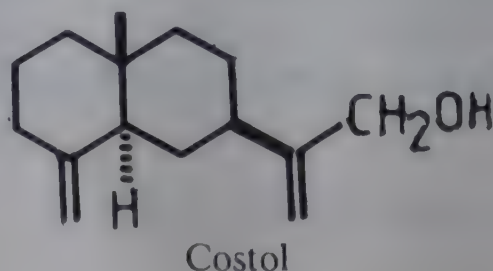
An unidentified alcohol, mp. 208°, a ketone, mp. 240° and (-)-asparagine from roots; Ca fumarate, chlorogenic acid, a flavonol heteroside and choline from leaves (*Boll. Chim. Farm.* 1967, 106, 671; *Chem. Abstr.* 1968, 68, 46972 a).

Distribution : Himalayas from Kashmir to Nepal, alt. 1800-3000 m.

S. lappa (Decne.) Sch.-Bip. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 222).

Plant extract raised blood pressure, relaxed plain muscles of intestine and uterus, antagonised spasmogenic action of acetylcholine and histamine in rats. It showed marked bronchodilator action in guinea pig but maximum response was inferior to that of epinephrine. Essential oil in low concentration stimulated heart in situ but in higher doses depressed it. Plant extractive contained essential oil (1.39), alkaloids (0.05%) and resins (*J. Pharm. Sci.* 1961, 50, 679). Lactone fraction and delactonised oil exhibited hypotensive, spasmolytic and bronchodilatory effects. No antitussive activity was detected in any fraction but slight diuretic property was observed (*Indian J. Med. Res.* 1967, 55, 1078).

Structure and absolute configuration of costol established (*Collect. Czech. Chem. Commun.* 1959, 24, 2365); taraxasterol, mp. 222° and taraxasteryl acetate, mp. 246°, isolated from leaves (*Curr. Sci.* 1968, 37, 550); 22,23-dihydrostigmasterol from plant (*Can. J. Chem.* 1968, 46, 2325).

NEW COMPOUNDS

SAXIFRAGA (Saxifragaceae)

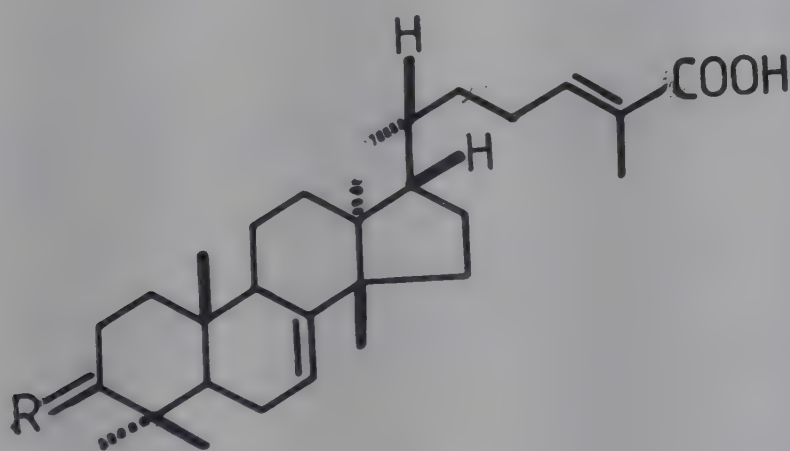
S. ligulata Wall.; see *Bergenia ciliata* (Haw.) Sterb. forma *ligulata* Yeo

SCHINUS (Anacardiaceae)

S. terebinthefolius Raddi

A new triterpene - terebinthone - from berries (*J. Pharm. Sci.* 1962, 51, 245); schinol (0.35%), mp. 145°, from berries; relationship of schinol to terebinthone demonstrated (*J. Pharm. Sci.* 1962, 51, 1136); revised structures of schinol and terebinthone proposed (*Bull. Soc. Chim. Fr.* 1963, 911).

Distribution : Native of temperate and tropical regions of South America, introduced into Indian gardens as ornamental.

NEW COMPOUNDS

Schinol

R = H, α -OH

Terebinthone

R = O

SCINDAPSUS (Araceae)

S. officinalis (Roxb.) Schott (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 224).

Two glucosides - scindapsin A and scindapsin B - two coloured compounds, mp. 199° and 231°, a sterol and a mixture of sugars from fruits; glucosides on acid hydrolysis yielded scindapsinidines A and B respectively and glucose (*J. Sci. Ind. Res.* 1959, 18B, 427).

SCOPARIA (Scrophulariaceae)

S. dulcis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 224).

A triterpene (0.1%), mp. 288° and mannitol isolated from roots and dulcitol from aerial parts (*Sci. Res.* 1964, 1, 3, 57; *Chem. Abstr.* 1964, 60, 11047 e).

SCOPOLIA (Solanaceae)

S. anomala (Link & Otto) Airy-Shaw syn. *S. lurida* Dunal (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1056, p. 224).

Hyoscyamine, atropine and a mixture of other alkaloids isolated (*Trudy Vsesoyuz Nauch.-Issledovatel. Inst. Lekarstv. i Aromat. Rast.* 1959, 79; *Chem. Abstr.* 1962, 56, 1527 a); detection of atropine, scopolamine and two other alkaloids, presumably scopoline or tropine and cuscohygrine, by PC (*Acta Pol. Pharm.* 1961, 18, 49; *Chem. Abstr.* 1962, 56, 2712 g); rutin, chlorogenic acid, caffeic acid and scopoletin from leaves; scopoline, scopoletin and its glycoside from roots (*Diss. Pharm.* 1969, 21, 65; *Chem. Abstr.* 1969, 71, 64044 r).

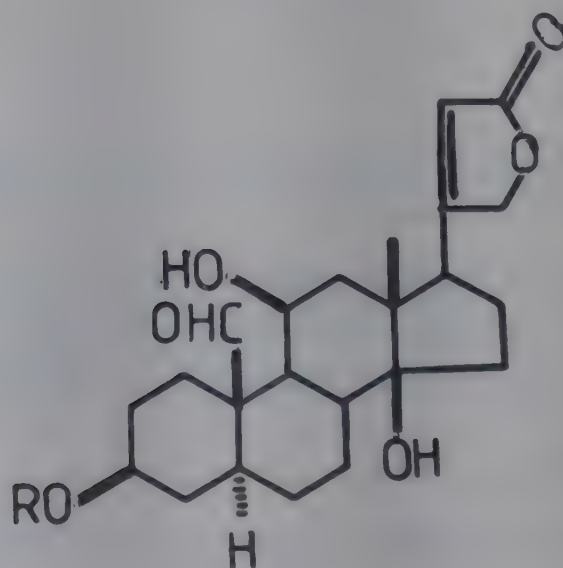
S. lurida Dunal; see *S. anomala* (Link & Otto) Airy-Shaw

SECURIGERA (Papilionaceae)

S. securidaca (L.) Degen. & Dorf.

Weakly cardiotonic compound, mp. 235°, and two other substances, mp. 192° and 177°, isolated from seeds (*Med. Prom. SSSR* 1963, 17, 21; *Chem. Abstr.* 1964, 60, 9099 e); cardenolides - securidaside, mp. 177°, securiside, mp. 192°, and securigenin, mp. 234° - from seeds (*Khim. Pri. Soedin.* 1965, 1, 153; *Chem. Abstr.* 1965, 63, 15222 c); securidaside shown to be bioside of securigenin; it was characterised as 3β-[O-β-D-glucopyranosyl-(1→4)-β-D-xylopyranosyl]-11β,14β-dihydroxy-19-oxo-5α-card-20(22)-enolide (*Khim. Pri. Soedin.* 1966, 2, 438; *Chem. Abstr.* 1967, 67, 11698 t).

Distribution : Native of the Mediterranean region and other parts of Europe. Cultivation in Bihar and West Bengal has been reported.

NEW COMPOUNDS

Securigenin

R = H

Securidaside

R = Xyl(4→1)Glu

BIOLOGICAL ACTIVITY

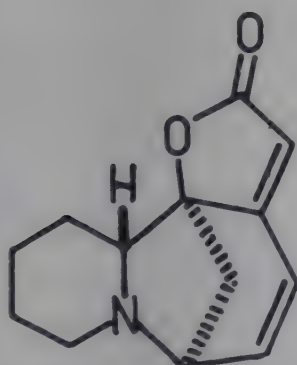
Substance, mp. 192° , showed cardiac activity of 70,000 frog units/g and substance, mp. 177° , of 50,000 frog units/g (*Med. Prom. SSSR* 1963, 17, 21; *Chem. Abstr.* 1964, 60, 9099 e).

SECURINEGA (Euphorbiaceae)

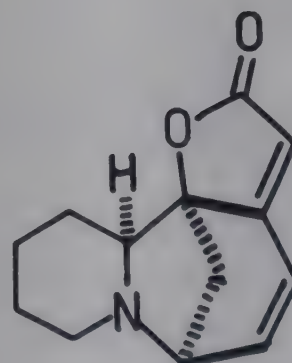
S. suffruticosa (Pall.) Rehder

Securinine (0.2-0.3%), mp. 142° , isolated from leaves (*Chem. Ind.* 1962, 1652; *Tetrahedron Lett.* 1962, 1199; USSR 168,300 (1965), Feb. 18; *Chem. Abstr.* 1965, 62, 14427 e; *Yakugaku Zasshi* 1963, 83, 602; *Chem. Abstr.* 1963, 59, 9087 c; *Chem. Pharm. Bull.* 1965, 13, 1307); crystal structure of securinine (*Chem. Ind.* 1964, 1691); detection of six alkaloids in leaves and young stems by PC, securinine predominating (*Poznan. Tow. Przyi. Nauk. Wydz. Lek., Pr. Kom. Farm.* 1965, 3, 115; *Chem. Abstr.* 1965, 63, 7349 f); three new alkaloids - securinols A, B and C - from leaves besides known allosecurinine and dihydrosecurinine (*Chem. Pharm. Bull.* 1965, 13, 1307); n-triacontanol and allosecurinine, mp. 128° , from leaves (*Indian J. Chem.* 1966, 4, 459); a new alkaloid - securitinine - isolated from root bark and its structure elucidated (*Chem. Pharm. Bull.* 1967, 15, 1633).

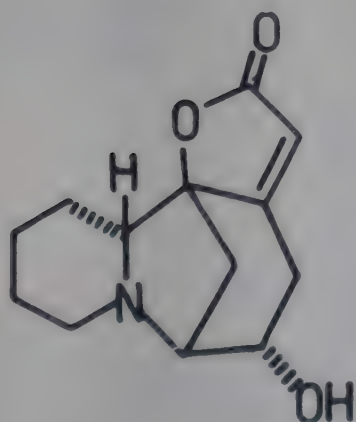
Distribution : Grown in Rongo, North Bengal, on experimental basis.

NEW COMPOUNDS

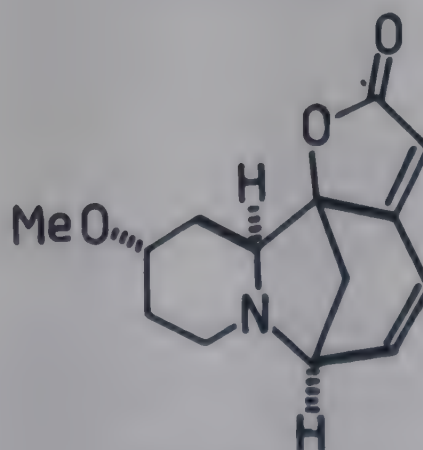
Securinine



Allosecurinine



Securinol A



Securitinine

BIOLOGICAL ACTIVITY

Securinine stimulated central nervous system (Fr. 1,291,526 (1962) April 27; *Chem. Abstr.* 1963, 58, 416 d).

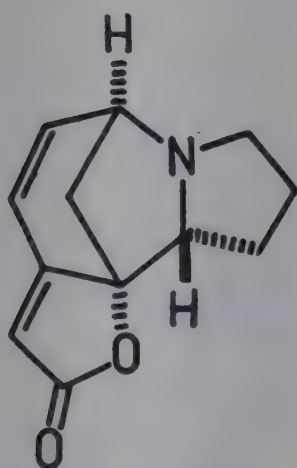
S. virosa (Roxb. ex Willd.) Baillon syn. *Flueggia microcarpa* Blume

H. - Dalme, Patala, Bakarcha, Rithoul; Mar. - Kodarsi, Pandharpali; Guj. - Shinwi, Thumri; Tel. - Mekarayi, Sulamunta; Tam. - Kottagom, Pambiri, Irublai, Vardhula, Vellaipula; Kan. - Bili-hooli; Mal. - Perinklavi; Oriya - Janjingi, Kanilehya; Goa. - Paropo; Khasi - Dieng-krong-wait-lam; Garo - Dumikron; Cachar - Sugane; Santal - Remrehorte; Nep. - Phalame; Lepcha - Iktibi, Mantel - kung.

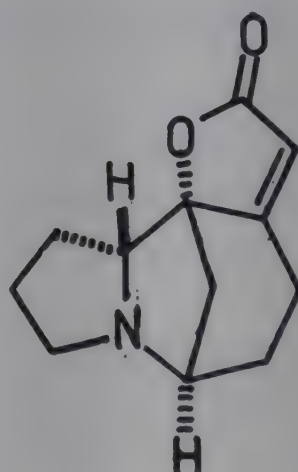
Virosecurinine, mp. 141° , isolated from leaves and structure elucidated (*Chem. Ind.* 1962, 1651; *ibid.* 1964, 1263; *Tetrahedron* 1963, 19, 609); new alkaloids, viroallosecurinine, mp. 136° , from leaves and virosine, mp. 135° , from root bark (*Chem. Ind.* 1964, 1263); isolation of norsecurinine HCl, mp. 225° , and dihydronorsecurinine, mp. 135° , from roots and elucidation of their structures (*Chem. Pharm. Bull.* 1965, 13, 786; *Chem. Abstr.* 1965, 63, 11633 d); preferred conformations of allosecurinine and dihydrosecurinine determined (*J. Org. Chem.* 1964, 29, 3441).

Distribution : Throughout India, ascending upto 2000 m. in hills and Andaman Islands.

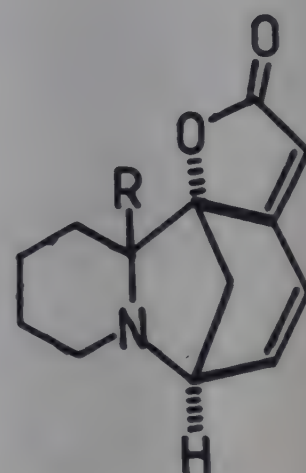
NEW COMPOUNDS



Norsecurinine



Dihydronorsecurinine



Viroallosecurinine

R = α -H

Virosecurinine,

R = β -H

SEDUM (Crassulaceae)

S. asiaticum DC.; see *S. wallichianum* Hook.

S. crassipes Wall. ex Hook.f. & Thoms.; see *S. wallichianum* Hook.

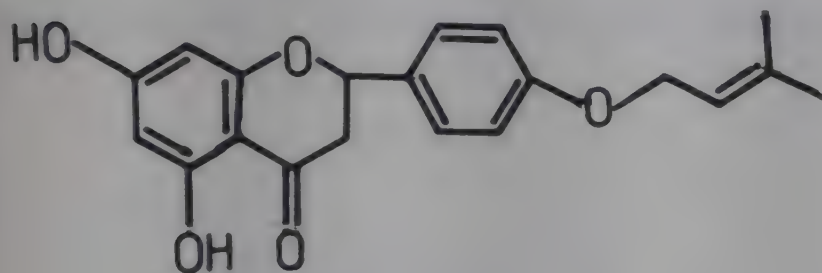
S. wallichianum Hook. syn. *S. crassipes* Wall. ex Hook.f. & Thoms., *S. asiaticum* sensu Hook.f. (non DC.), *Rhodiola wallichiana* (Hook.) Fu (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 225).

Alkaloids (0.0007%) present in plant (*Abh. Deut. Akad. Wiss. Berlin Kl, Chem. Geol. Biol.* 1963, 111; *Chem. Abstr.* 1964, 61, 13625 h).

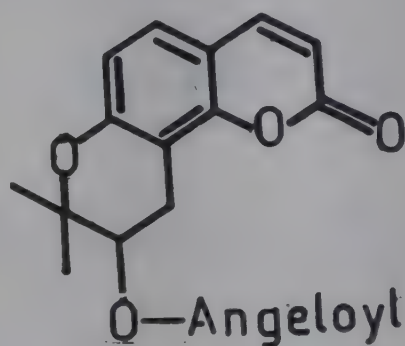
SELINUM (Apiaceae)*S. vaginatum* (Edgew.) C. B. Clarke

A new coumarin - selinidin, mp. 97° - isolated from roots (*Tetrahedron Lett.* 1964, 3367); a new flavanone - selinone, mp. 151° - from roots (*Tetrahedron Lett.* 1967, 853); a new sesquiterpene - vaginatin, mp. 77° - from roots (*Chem. Commun.* 1968, 584).

Distribution : Himalayas from Kashmir to Kumaon, alt. 1800-3600 m.

NEW COMPOUNDS

Selinone



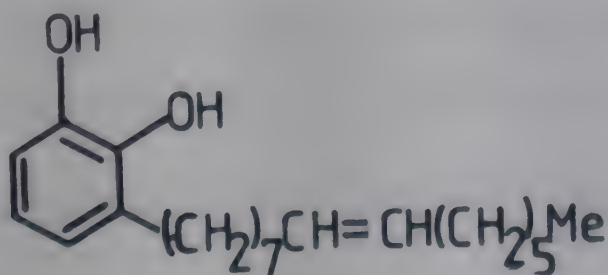
Selinidin

SEMECARPUS (Anacardiaceae)

S. anacardium L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 225).

Plant extract showed direct depressant effect on isolated frog heart and rabbit intestine and antagonised spasmogenic effects of carbachol, histamine, barium chloride and pitocin. Trypan blue capillary permeability test was found to be positive. It produced delayed hypotension in dogs which remained unaltered after prior atropinisation (*Indian J. Med. Res.* 1967, 55, 155).

Bhilawanol from fruits was shown to be a mixture of cis and trans isomers of ursuhanol (*Nature* 1960, 186, 389).

NEW COMPOUNDS

Bhilawanol

SENECIO (Asteraceae)*S. bracteolatus* Hook.f.

α -Pinene, β -phellandrene, two saturated and two unsaturated carbonyl compounds, two

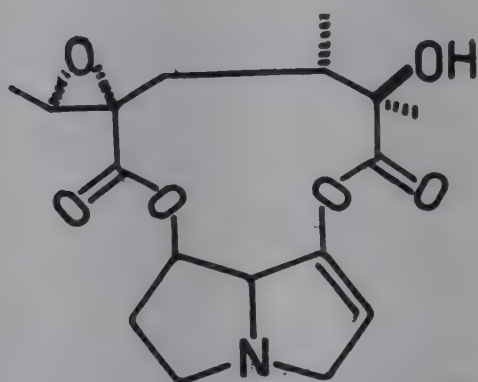
terpenes and a sesquiterpene alcohol in essential oil (*Anales Soc. Cient. Arg.* 1964, 177, 21; *Chem. Abstr.* 1965, 62, 8929 d).

Distribution : Sikkim, alt. 4500-4800 m.

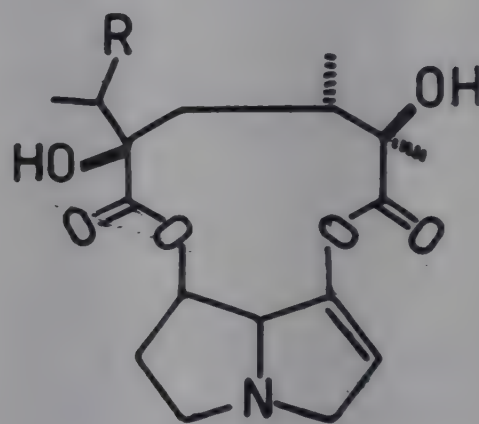
S. chrysanthemoides DC. syn. *S. jacobaea* D. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 225).

Structures of jacobine, jacoline and jaconine elucidated (*J. Am. Chem. Soc.* 1959, 81, 5201); absolute configuration of jacoline (*J. Am. Chem. Soc.* 1960, 82, 5253); seneciophylline (0.01%) from roots (*Curr. Sci.* 1964, 33, 585); total alkaloids (0.6), l-otosenine (0.24), renardine (0.12) and jacobine (0.08%) from aerial parts of plant (*Khim. Pri. Soedin.* 1968, 4, 258; *Chem. Abstr.* 1969, 70, 44831 w).

NEW COMPOUNDS



Jacobine



Jacoline

R = OH

Jaconine

R = Cl

S. jacobaea D. Don; see *S. chrysanthemoides* DC.

S. ligularia Hook.f.; see *Ligularia sibirica* (L.) Cass.

S. nudicaulis Buch.-Ham. ex D. Don.

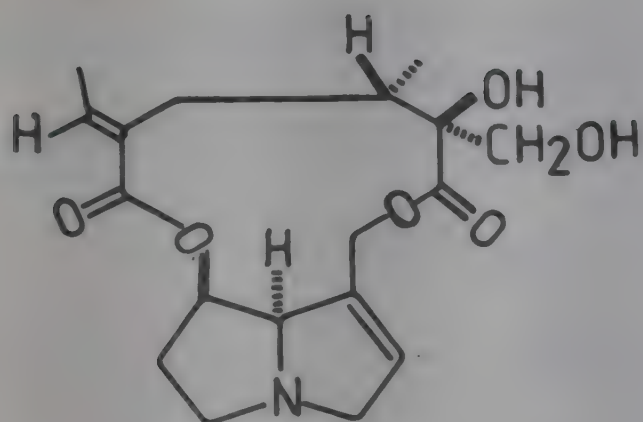
A new alkaloid (0.05%), mp. 213°, isolated (*Curr. Sci.* 1964, 33, 80).

Distribution : Himalayas from Kashmir to Sikkim, alt. 1500-3000 m.

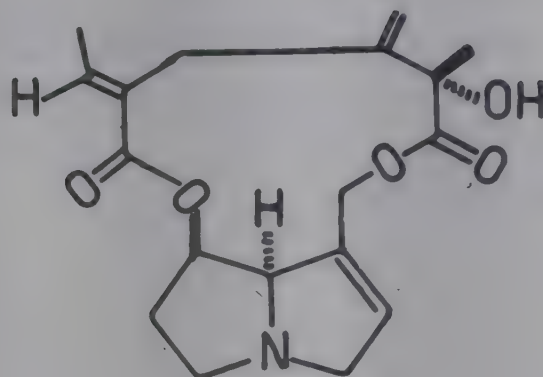
S. vulgaris L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 225).

Alkaloids - seneciophylline, mp. 216°, and retrorsine, mp. 212° - isolated (*Collect. Czech. Chem. Commun.* 1960, 24, 934).

NEW COMPOUNDS



Retrorsine



Seneciophylline

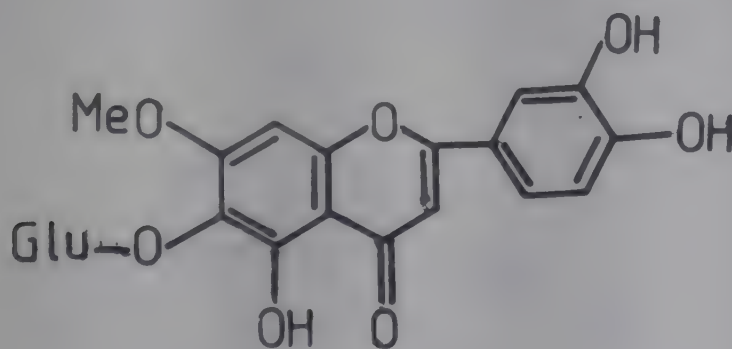
SESAMUM (Pedaliaceae)

S. indicum L.; see *S. orientale* L.

S. orientale L. syn. *S. indicum* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 225).

A flavonoid glucoside - pedaliin (0.3%), mp. 254° - isolated from leaves and structure determined (*Chem. Pharm. Bull.* 1960, 8, 59).

NEW COMPOUNDS



Pedaliin

SESBANIA (Papilionaceae)

S. grandiflora (L.) Poir. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 226).

A saponin, mp. 235°, from leaves which yielded oleanolic acid, galactose, rhamnose and glucuronic acid (*Proc. Nat. Acad. Sci. India*, 1964, 34A, 239; *Chem. Abstr.* 1965, 62, 10826 a).

S. speciosa Taub.

Tam.-Seemai agathi.

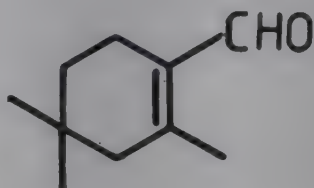
β-Sitosterol (stigmastanol), oleanolic acid and a neutral compound, mp. 252°, obtained by hydrolysis of saponin mixture from seeds (*Indian J. Chem.* 1964, 2, 376).

Distribution : Native of Kenya, introduced into India in Andhra Pradesh, Orissa, Tamil Nadu and Kerala.

SESELI (Apiaceae)

S. diffusum (Roxb. ex Sm.) Sant. & Wagh. syn. *S. indicum* W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 226).

A new monoterpene aldehyde - β -cyclolavandulal - from essential oil of seeds (*Tetrahedron Lett.* 1967, 2645).

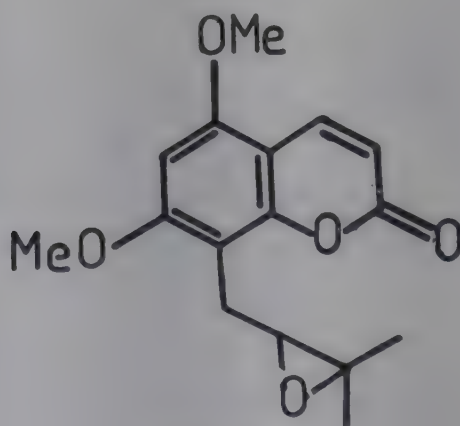
NEW COMPOUNDS β -Cyclolavandulal

S. indicum W. & A.; see *S. diffusum* (Roxb. ex Sm.) Sant. & Wagh

S. libanotis (L.) W. Koch. syn. *S. sibiricum* Benth. ex Clarke (non L.)

Osthol and fenchyl p-hydroxycinnamate from roots (*Phytochemistry* 1968, 7, 147); imperatorin, bergapten and a new coumarin - sibiricin - isolated; latter characterised as 5,7-dimethoxycoumarin-8- γ,γ -di-methylallylepoxide (*Tetrahedron* 1968, 24, 3247).

Distribution : Western Himalayas, alt. 2500-3500 m.

NEW COMPOUNDS

Sibiricin

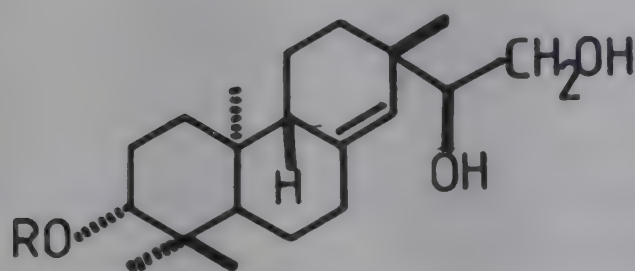
S. sibiricum Benth. ex Clarke; see *S. libanotis* (L.) W. Koch.

SIEGESBECKIA (Asteraceae)

S. orientalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 227).

Darutoside, mp. 248°, isolated and characterised as β -D-glucoside of darutigenol; structure of darutigenol determined as 7-darutene-3,17,18-triol (*Bull. Soc. Chim. Fr.* 1959, 693; *Chem. Abstr.* 1960, 54, 3489 h; *Bull. Soc. Chim. Fr.* 1960, 2171; *Chem. Abstr.* 1961, 55, 15441 e).

NEW COMPOUNDS



Darutigenol

R = H

Darutoside

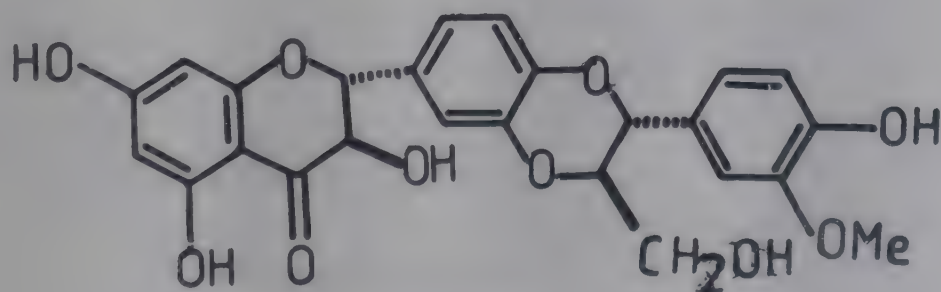
R = Glu

SILYBUM (Asteraceae)

S. marianum (L.) Gaertn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 227).

Silybin (silymarin, silybum substance E6) mp. 167° , isolated from fruits along with 4',5,7-trihydroxy-3',5'-dimethoxyflavonol and other compounds, mp. 151° , 167° , 173° , 200° and 206° (*Naturwiss.* 1965, 52, 305; *Chem. Abstr.* 1965, 63, 16297 f; *Tetrahedron Lett.* 1968, 6219; *Arzneim. Forsch.* 1968, 18, 688); cis,cis-heptadeca-1,8,15-trien-11,13-diyne-10-ol and 7-phenyl-2-hepten-4,6-diyne-1-al, mp. 63° , isolated (*Chem. Ber.* 1966, 99, 3201); three flavonoids from fruits (*Khim. Prir. Soedin.* 1968, 4, 49; *Chem. Abstr.* 1968, 69, 8876 k); structure of silybin (*Chem. Ber.* 1975, 108, 1482).

NEW COMPOUNDS



Silybin

BIOLOGICAL ACTIVITY

Silymarin was well tolerated by mice at 20 g/kg orally, by dogs at 1 g/kg orally and by rats at 130 mg/kg i.v. It did not affect animal or organ weight or blood parameters. It antagonised liver damage in rats induced by carbon tetrachloride, α -amanitine or chronic feeding of thioacetamide. Silymarin probably represents the liver-protecting properties of the plant (*Arzneim. Forsch.* 1968, 18, 698).

SISYMBRIUM (Brassicaceae)

S. irio L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 228).

Isorhamnetin isolated from seeds (*Curr. Sci.* 1967, 36, 206).

S. sophia L.; see *Descurainia sophia* (L.) Webb, ex Prantl

SKIMMIA (Rutaceae)

S. laureola (DC) Sieb. & Zucc. ex Walp. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 228).

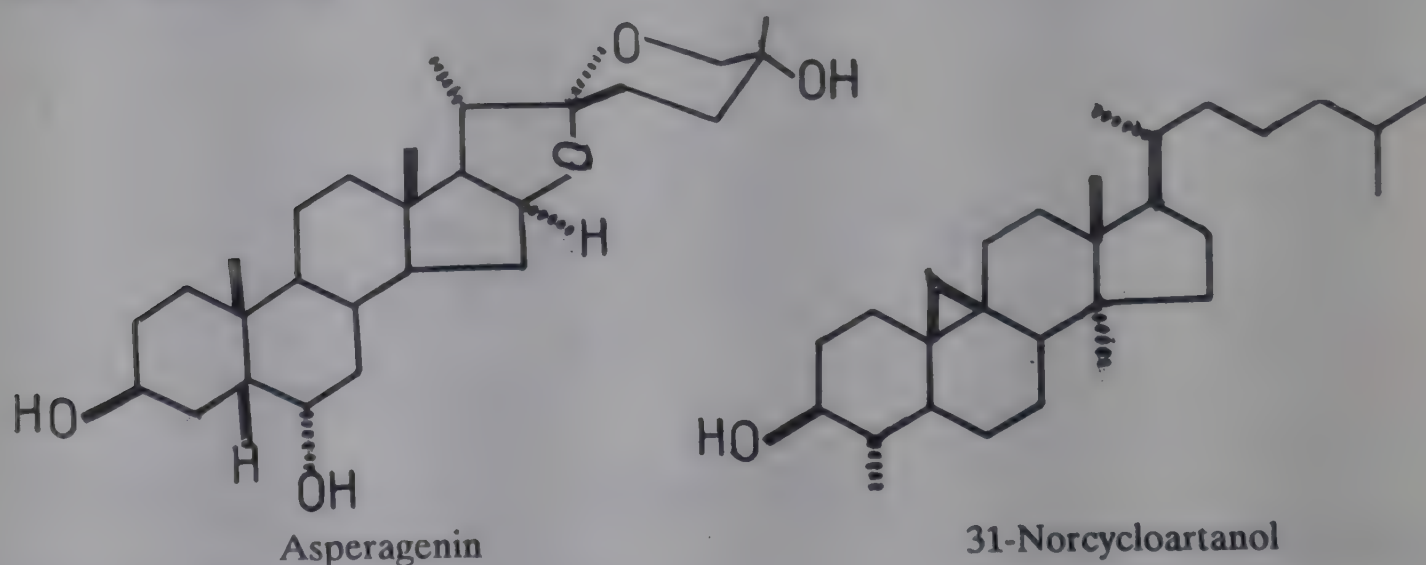
Skimmin, mp. 210°, and scopoletin, mp. 202°, isolated from bark; hydrolysis of former yielded umbelliferone and glucose (*J. Indian Chem. Soc.* 1960, 37, 420); linalool, β -phellandrene, geraniol, myrcene, α -pinene, nerol and traces of menthene from the essential oil of leaves (*Indian Oil Soap J.* 1966, 31, 303; *Chem. Abstr.* 1967, 66, 40667 s).

SMILAX (Smilacaceae)

S. aspera L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 228).

Hydrolysis of crude saponin yielded sarsasapogenin, mp. 200°, its pseudogenin, mp. 166°, a steroid sapogenin of neo series, mp. 110° and a new sapogenin - asperagenin, mp. 264° (*Curr. Sci.* 1967, 36, 653); 31-norcycloartanol, mp. 132°, and β -sitosterol from roots (*Tetrahedron Lett.* 1967, 3567); a new bisdesmosine 22-hydroxyfurostanol saponin - asperoside - from leaves (*Farm. Glas.* 1969, 25, 91; *Chem. Abstr.* 1969, 71, 64049 w).

NEW COMPOUNDS



SOJA (Papilionaceae)

S. hispida Moench; see *Glycine max* (L.) Merr.

SOLANUM (Solanaceae)

S. aculeatissimum Jacq. syn. *S. khasianum* Clarke, *S. myriacanthum* Dunal

Solasonine, mp. 276°, isolated (*Indian J. Chem.* 1964, 2, 424); solasodine and solakhasianin, mp. 251°, isolated from berries (*J. Pharm. Sci.* 1965, 54, 1828; *Indian J. Chem.* 1968, 6, 547).

Distribution : North-eastern India upto alt. of 2000 m.

S. aviculare Forst.f.

Crude solasodine glycoside isolated (Czech. 96,718 (1960) Sep. 15; *Chem. Abstr.* 1961, 55, 21493 a); detection of solasonine and solamargine in leaves, stems and roots and of solasodine in leaves by PC (*Planta Med.* 1961, 9, 216); besides these, glucoalkaloids detected in all parts of plant; no free aglycone detected (*Bull. Fac. Pharm.* 1963, 51; *Chem. Abstr.* 1965, 62, 8114 h); detection of steroid saponins in glycoalkaloids by PC and TLC; solasodine and solasodiene from acid hydrolysis of glycoalkaloids (*Med. Prom. SSSR* 1965, 19, 49; *Chem. Abstr.* 1965, 63, 2852 e); *Med. Prom. SSSR* 1965, 19, 35; *Chem. Abstr.* 1965, 63, 5708 h; *Tagungsber. Deut. Akad. Landwirtschaftswiss.* Berlin No. 27, 1961, 201; *Chem. Abstr.* 1964, 61, 3168 e).

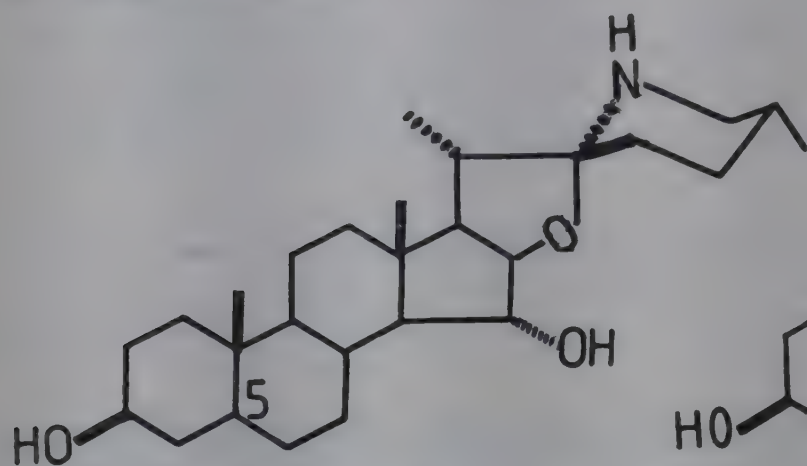
Distribution : Introduced in Kashmir for experimental cultivation for production of steroids.

S. dulcamara L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 229).

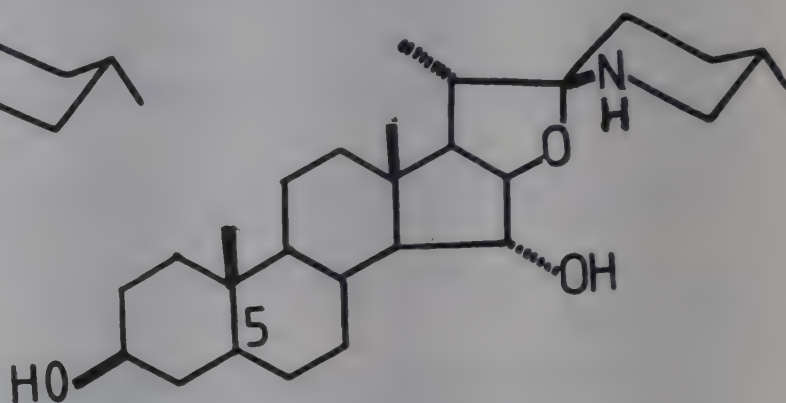
A new tetrasaccharide - soladulcidine tetroside (0.8%) - isolated (*Naturwiss.* 1959, 46, 207; *Chem. Abstr.* 1960, 54, 689 f); separation of tetrasaccharides of tomatidine, demissidine and soladulcidine as sparingly soluble adducts with cholesterol (*Pharm. Acta Helv.* 1960, 35, 30; *Chem. Abstr.* 1960, 54, 15830 g); detection of glycoalkaloids by PC; aglycone of soladulcidine tetroside identical with 5 α -solasodanol (*Tagungsber. Deut. Akad. Landwirtschaftswiss.* Berlin, No. 27, 1961, 297; *Chem. Abstr.* 1964, 60, 15679 g); α -solamarine, mp. 278°, β -solamarine, mp. 275°, γ -solamarine, mp. 243°, isolated; soladulcamaridine was a mixture of 5-tomatidenol, tomati-3,5-diene and solasodine (*Acta. Chem. Scand.* 1962, 16, 1819); chemical studies on β -solamarine; acid hydrolysis yielded tomatid-5-en-3 β -ol, glucose and rhamnose (1:1:2); γ -solamarine yielded same compounds in ratio of 1:1:1; γ -solamarine and tomatid-5-en-3 β -ol glucoside also obtained by partial hydrolysis (*Acta Chem. Scand.* 1963, 17, 1852); presence of solasodine type compounds in leaves (*Izuch. i Is'polz Lekarstv. Resursov SSSR Sb.* 1964, 288; *Chem. Abstr.* 1965, 62, 10821 e); detection of four alkaloidal glycosides by PC; acid hydrolysis of glycoside mixture yielded yamogenin (22R, 25S-spirost-5-en-3 β -ol) and tomatid-5-en-3 β -ol (22S, 25S-spirosol-5-en-3 β -ol), mp. 235° (*Tetrahedron Lett.* 1963, 329; *Ann. Chem.* 1965, 681, 187; *Arch. Pharm.* 1965, 298, 285; *Chem. Abstr.* 1965, 63, 7067 b); solasonine and β -solamargine, mp. 209°, present in leaves at flowering time (*Planta Med.* 1964, 12, 543); soladulcidine, mp. 209°, solasodine, mp. 210°, tomatid-5-en-3 β -ol, mp. 235°, tigogenin, mp. 202°, diosgenin, mp. 203° and yamogenin from seeds (*Arch. Pharm.* 1965, 298, 285; *Chem. Abstr.* 1965, 63, 7067 b); four new spirosolane alkaloids - 15 α -hydroxysoladulcidine, mp. 213°, 15 α -hydroxysolasodine, 15 α -hydroxytomatidine, mp. 191° and 15 α -hydroxytomatidenol, mp. 237° - from roots (*Ann. Chem.* 1966, 694, 169); in addition to α -, β - and γ -solamarines, two new glycosides - α -L-rhamnopyranosyl (1 \rightarrow 2)- β -D-glucopyranosyl-tomatidenol (γ 1-solamarine), mp. 268° and β -D-glucopyranosyl (1 \rightarrow 3)- β -D-galactopyranosyl-tomatidenol, mp. 265°, (δ -solamarine) - isolated (*Phytochemistry* 1966, 5, 1227); soladulcidine or tomatidenol present as main aglycone (*Herba Hung.* 1967, 6, 13; *Chem. Abstr.* 1968, 69, 57440 x); soladulcidine [(25R)-5 α , 22 α -N-spirosolane-3 β -ol], solasodine [(25R)-22 α -N-spirosol-5-en-3 β -ol], tomatidenol [(25S)-22 β -

N-spirosol-5-en-3 β -ol] and tomatidine [(25S)- 5 α ,22 β -N-spirosolan-3 β -ol], from leaves of a hybrid F1 by crossing a tomatidenol with a soladulcidine type *S. dulcamara* (*Naturwiss.* 1968, 55, 182; *Chem. Abstr.* 1968, 68, 117110 f); configuration of soladulcidine (*Acta. Chem. Scand.* 1965, 19, 1365); crystal structure of tomatidine (*J. Chem. Soc. C* 1967, 956).

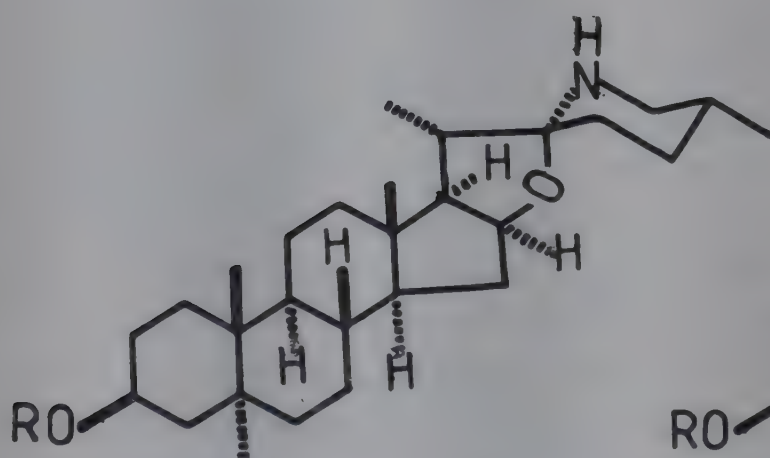
NEW COMPOUNDS



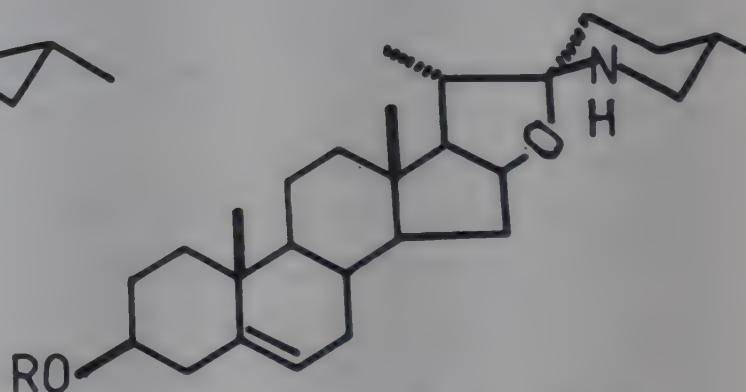
15-Hydroxysoladulcidine (5 α H)
15-Hydroxysolasodine (Δ^5)



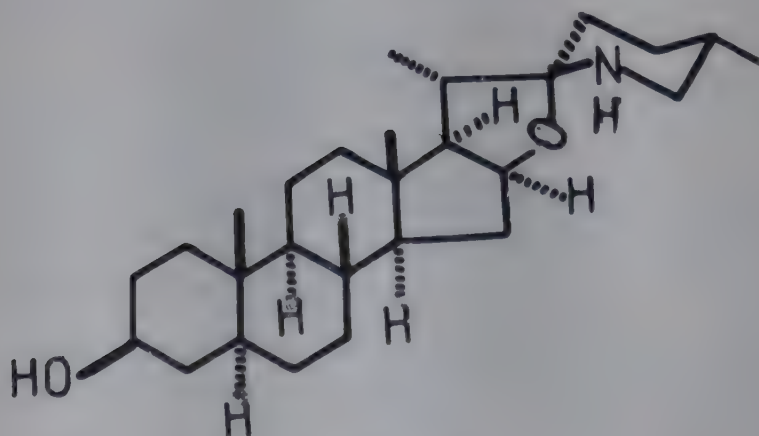
15-Hydroxytomatidine (5 α H)
15-Hydroxytomatidenol (Δ^5)



Soladulcidine
R = H
Soladulcidinetetroside
R = 2Glu + Gal + Xyl



Tomatid-5-en-3 β -ol
R = H
 α -Solamarine
R = Gal + Glu + Rha
 β -Solamarine
R = Glu + Rha + Rha
 γ -Solamarine
R = Glu + Rha
 γ_1 -Solamarine
R = Rha(1 \rightarrow 2)Glu
 δ -Solamarine
R = Glu(1 \rightarrow 3)Gal



Tomatidine

BIOLOGICAL ACTIVITY

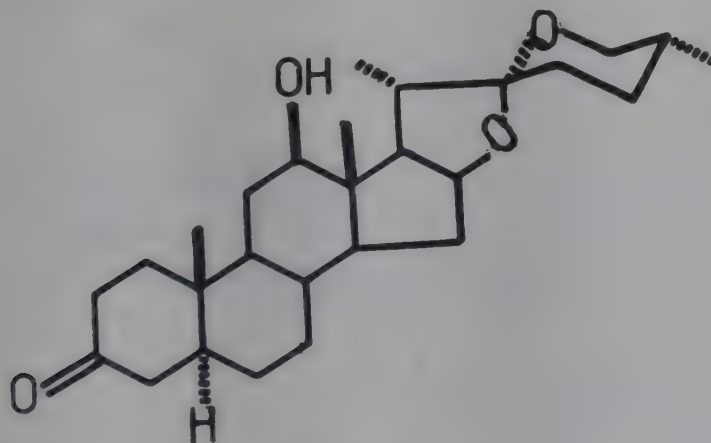
Solasolidine at 35 mg/kg dose slightly increased blood pressure in cats whereas solasoline at same dose caused a fall in blood pressure of about 15 mm Hg. Both had spasmolytic effect on isolated rabbit intestine. Solasoline sedated cocaine-excited mice but solasolidine had no such effect. Solasoline showed positive chronotropic effect whereas solasolidine showed negative inotropic effect on isolated frog heart (*Acta Pol. Pharm.* 1959, 16, 197; *Chem. Abstr.* 1960, 54, 1804 f).

S. ferox L.; see *S. stramoniifolium* Jacq.

S. hispidum Pers.

Hispidogenin, mp. 208°, isolated from berries, characterised as 3-oxo-12 β -hydroxy-5 α -isosapogenin (*Chem. Ind.* 1965, 1653).

Distribution : Native of South America. Naturalised in Dehradun region.

NEW COMPOUNDS

Hispidogenin

S. incanum L.; see *S. melongena* L. var. *incanum* (L.) O. Ktze.

S. khasianum Clarke; see *S. aculeatissimum* Jacq.

S. lycopersicum L.; see *Lycopersicon lycopersicum* (L.) Karsten

S. melongena L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 229).

Solasodine isolated from fruits (*J. South African Chem. Inst.* 1960, 13, 45; *Chem. Abstr.* 1960, 54, 22871 d; *Izuch. i Is'polz. Lekarstv. Resursov SSSR Sb.* 1964, 288; *Chem. Abstr.* 1965, 62, 10821 e).

S. melongena L. var. *incanum* (L.) O. Ktze. syn. *S. incanum* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 229).

Solasonine isolated (*Pakistan J. Sci. Ind. Res.* 1967, 10, 81; *Chem. Abstr.* 1968, 68, 47010 x).

S. myriacanthum Dunal; see *S. aculeatissimum* Jacq.

S. nigrum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 229).

Detection of solasonine and solamargine in leaves by PC; glucoalkaloids from immature fruits (*Farmatsiya* 1962, 12, 16; *Chem. Abstr.* 1963, 58, 8233 g; *Bull. Fac. Pharm. Cairo Univ.* 1963, 51; *Chem. Abstr.* 1965, 62, 8114 h); solasodine type compounds from leaves and fruits (*Izuch. i Is'polz Lekarstv. Resursov SSSR Sb.* 1964, 288; *Chem. Abstr.* 1965, 62, 10821 e); identification of tigogenin in berries (*Phytochemistry* 1965, 4, 967).

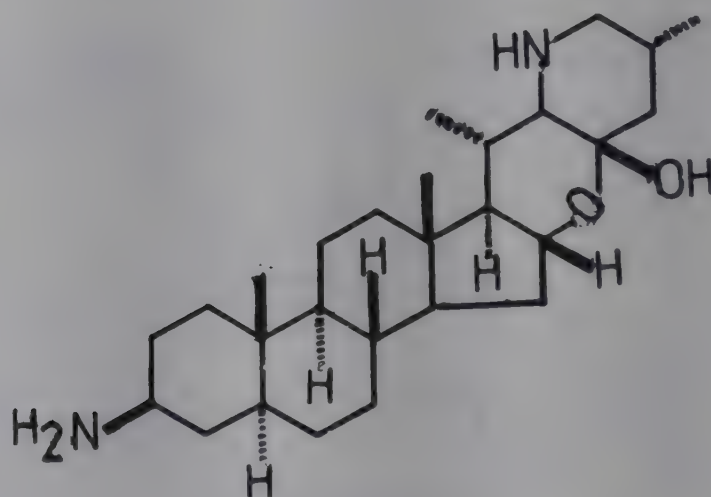
S. pseudocapsicum L.

Eng. - Jerusalem cherry.

Solanocapsine, mp. 215°, unlike all other solanum alkaloids, had 3 α -NH₂ instead of 3 α -OH group (*Acta Chem. Scand.* 1959, 13, 2039); structure of solanocapsine revised as 3 β -amino-22,26-imino-16 β ,23-epoxy-5 α ,22 α ,23 β ,25 ξ -cholestan-23-ol (*Experientia* 1960, 16, 536); crystal structure of solanocapsine (*Tetrahedron* 1970, 26, 3569).

Distribution : Introduced in gardens naturalised in Dehradun region and Himachal Pradesh.

NEW COMPOUNDS



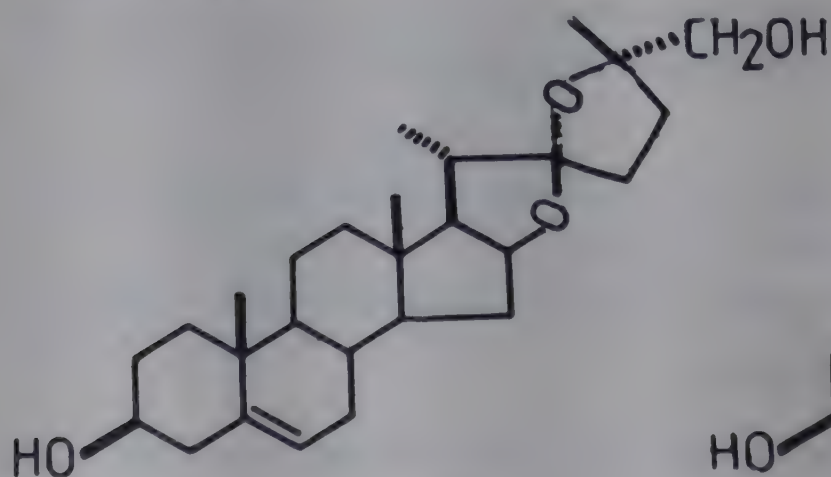
Solanocapsine

S. sisymbriifolium Lamk.

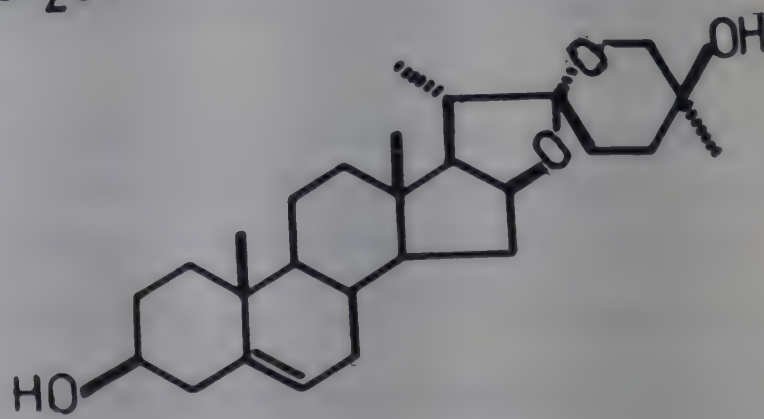
Isonuatigenin and nuatigenin obtained by acid hydrolysis of amorphous glycoside P from roots (*Tetrahedron* 1964, 20, 387).

Distribution : Native of South America, now naturalised in Western Ghats, West Bengal, Assam and Meghalaya upto alt. of 1300 m.

NEW COMPOUNDS



Nuatigenin



Isonuatigenin

S. spirale Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 229).

Glycoalkaloids present in roots (*Bull. Calcutta Sch. Trop. Med.* 1958, 6, 162; *Chem. Abstr.* 1960, 54, 1807 b).

S. stramonifolium Jacq. syn. *S. ferox* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 229).

Glucoalkaloid - solanine, mp. 282° - isolated from fruits (*Naturwiss.* 1966, 53, 108; *Chem. Abstr.* 1966, 64, 14243 b); solanocarpone and carpesterol from seed oil (*J. Indian Chem. Soc.* 1968, 45, 739).

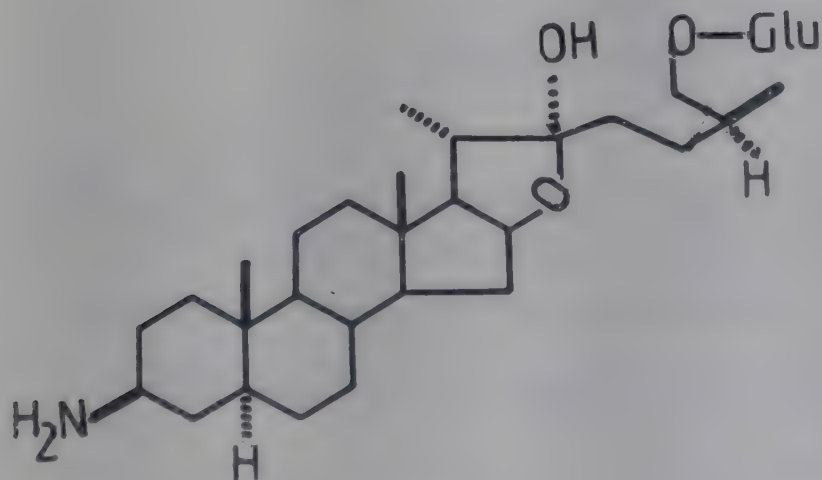
S. surattense Burm.f. syn. *S. xanthocarpum* Schrad. & Wendl. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 230).

Crude plant extract caused hypotension which has been attributed to release of histamine by some constituents (*Indian J. Med. Res.* 1967, 55, 723).

S. torvum Swartz (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 230).

Steroidal alkaloid glycoside - jurubine [(25-S)-3 β -amino-5 α -furostane-22 α ,26-diol-O(26)- β -D-glucopyranoside] - isolated from roots; leaves contained N-free steroid saponins which on acid hydrolysis yielded neochlorogenin and paniculogenin (*Kulturpflanze* 1968, 15, 199; *Chem. Abstr.* 1968, 69, 27721 x).

NEW COMPOUNDS



Jurubine

S. trilobatum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 230).

Tomatid-5-en-3 β -ol [(25S)-22 β -N-spirosol-5-en-3 β -ol] isolated (*Aust. J. Chem.* 1969, 22, 1569).

S. tuberosum L.

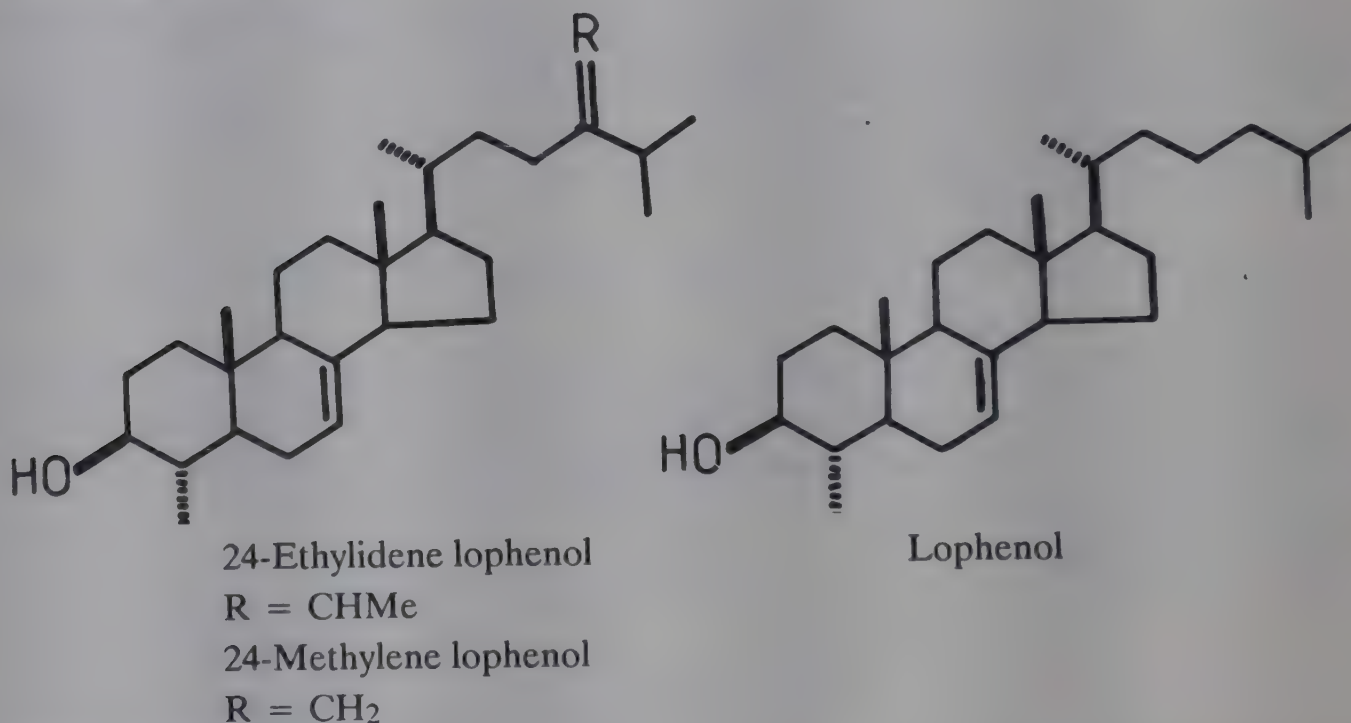
H. - Alu; Mar. & Guj. - Batata; Tel. - Bangaladumpa, Wralagadda; Tam. - Uralakilangu; Kan. - Batale, Alugidde; Mal. - Urulan kizhangu.

Tomatid-5-en-3 β -ol, yamogenin and solanidine glycosides- α -solanine, α -chaconine, β -

chaconine and solacauline - isolated from sprouts (*Kulturpflanze* 1963, 11, 422; *Chem. Abstr.* 1964, 60, 14828 d); in addition to cycloartenol, stigmasterol, β -sitosterol, campesterol and cholesterol, a mixture of 4 α -monomethyl sterols isolated from leaves; these were mainly 4 α -methyl-5 α -stigmasta-7,24(28)-diene-3 β -ol (24-ethylidene lophenol), lophenol and 24-methylene lophenol (*Tetrahedron* 1964, 20, 2575); eight major pigments - β -carotene, β -carotene-5,6-monoepoxide, cryptoxanthin-5,6-diepoide, lutein, cis-violaxanthin, cis-antheraxanthin-5,6-monoepoxide, cis-neoxanthin and one unidentified compound - and four minor pigments detected in fruits (*Biochem. J.* 1965, 94, 25P).

Distribution : Widely cultivated in India.

NEW COMPOUNDS



S. wrightii Benth.

Solasonine, solamargine, solasodine and a saponin from unripe fruits; hydrolysis of saponin yielded chlorogenin (*Phytochemistry* 1967, 6, 433).

Distribution : Native of Mexico, introduced into Indian gardens as ornamental.

S. xanthocarpum Schrad. & Wendl.; see *S. surattense* Burm.f.

SOLIDAGO (Asteraceae)

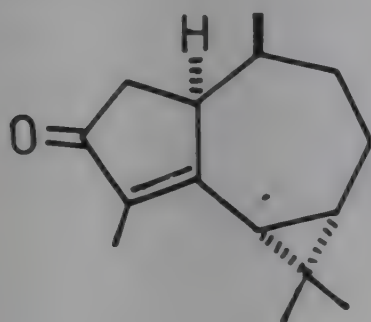
S. canadensis L.

β -Cadinene, α -curcumene, β -caryophyllene, γ -selinene, myricyl alcohol, a diterpene alcohol, mp. 168°, an acid, mp. 80°, cyclocolorone, bp. 135°/0.5 mm., and a triterpene alcohol, mp. 214°, isolated (*Collect. Czech. Chem. Commun.* 1962, 27, 2459); a new diterpene - solidago diterpene A, mp. 133° - isolated from roots; chemical studies to elucidate its structure (*Pharmazie* 1965, 20, 523; *Chem. Abstr.* 1965, 63, 14917 f; *Acta Chem. Scand.* 1966, 20, 904); quercetin, kaempferol, rutin, isorhamnetin and isorhamnetin-3-glucorhamnoside, mp. 165°, isolated (*Khim. Prir. Soedin.* 1969, 5, 121; *Chem. Abstr.* 1969, 71, 53516 v); constitution and stereostructure of solidagenone and its epimeric spiro ether elucidated (*Tetrahedron*

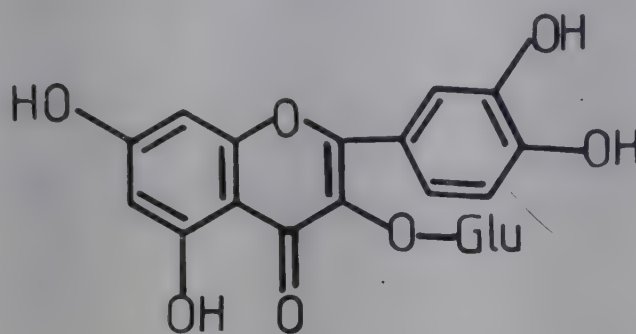
1969, 25, 2233); a new flavone glucoside, mp. 220° , isolated from aerial parts and characterised as 5,7,3',4'-tetrahydroxyflavone-3- β -D-glucopyranoside (I) (*Khim. Pri. Soedin.* 1968, 4, 381; *Chem. Abstr.* 1969, 70, 78317 y).

Distribution : Native of America, grown as a hedge plant in gardens.

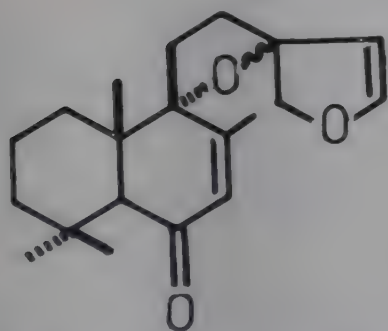
NEW COMPOUNDS



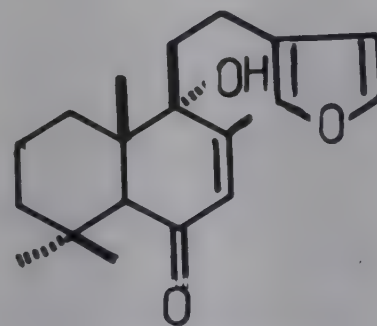
Cyclocolorenone



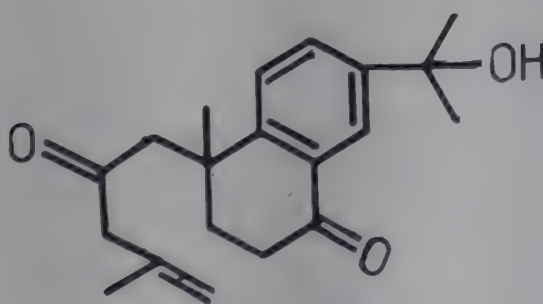
I



Solidagenone spiro ether



Solidagenone



Solidago diterpene A

S. virgaurea L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 230).

Quercitrin, rutin, isoquercitrin, astragalins and kaempferol rhamnoglucoside isolated (*Naturwiss.* 1964, 51, 636; *Chem. Abstr.* 1965, 62, 6802 g).

SONNERATIA (Lythraceae)

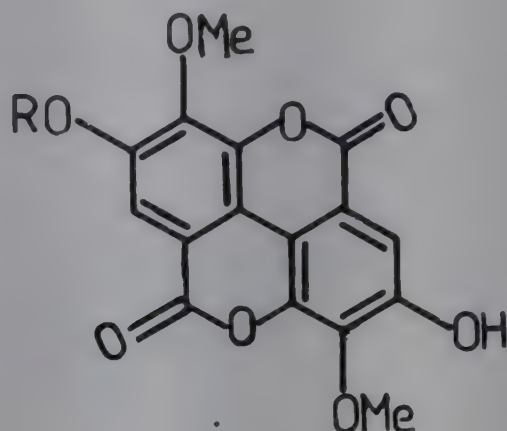
S. apetala Buch.-Ham.

B. - Keora; Mar. - Kandal, Undi; Tel. - Kyalanki; Tam. - Marama; Oriya - Keora, Kerua.

3,3',4'-Trimethoxy-4'-hydroxydiphenic acid dilactone (I), mp. 285° and 3,3'-dimethoxy-4,4'-dihydroxydiphenic acid dilactone (II), mp. 340° , from bark (*J. Sci. Ind. Res.* 1962, 21B, 549).

Distribution : Tidal forests of West Bengal and peninsular India.

NEW COMPOUNDS



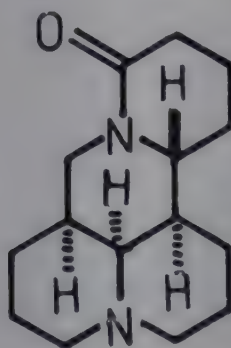
I
R = Me
II
R = H

SOPHORA (Papilionaceae)

S. tomentosa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 231).

Matrine, mp. 76°, methylcytisine, cytisine and an unidentified base isolated (*New Zealand J. Sci.* 1961, 4, 13; *Chem. Abstr.* 1961, 55, 19135 h); crystal structure of matrine (*Kristallografiya*, 1978, 23, 1189; *Chem. Abstr.* 1979, 90, 87707 r).

NEW COMPOUNDS



Matrine

SORBARIA (Rosaceae)

S. sorbifolia A. Br.; see *S. tomentosa* (Lindl.) Rehder

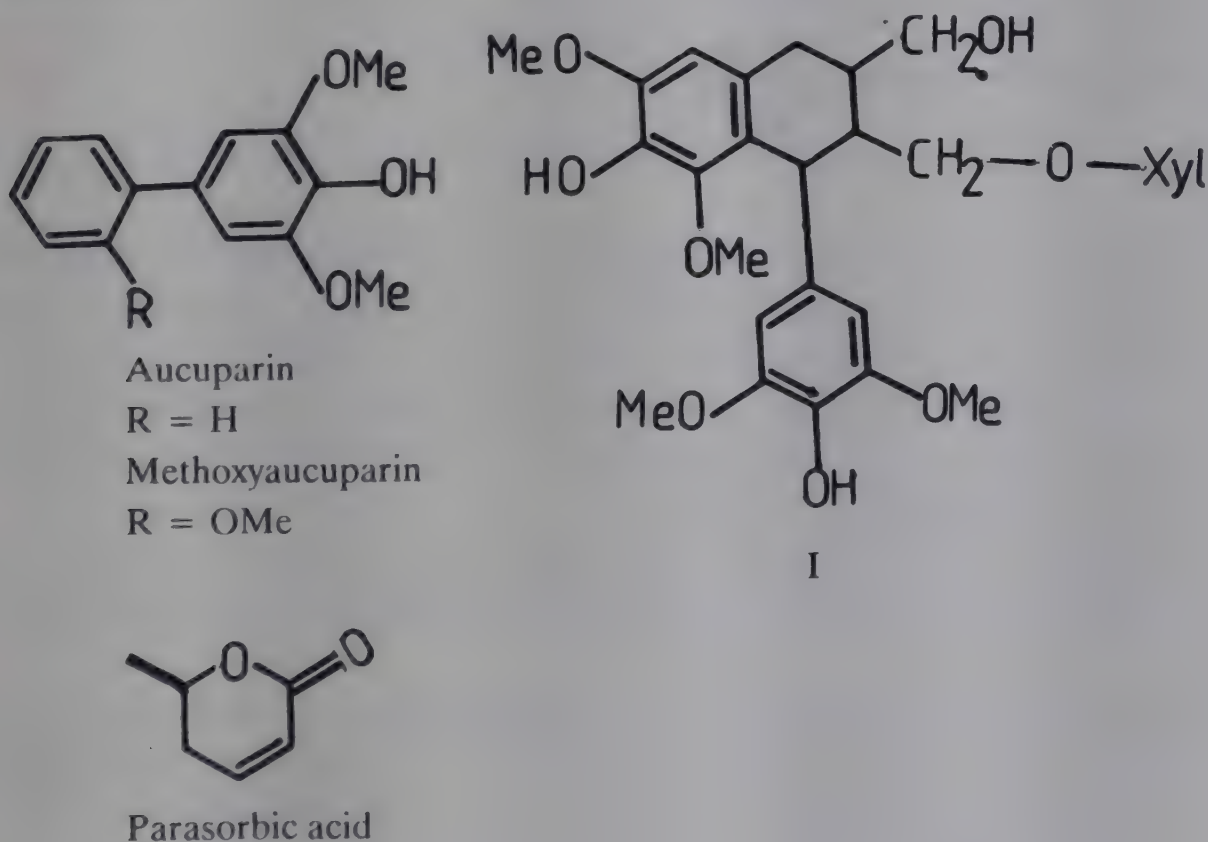
S. tomentosa (Lindl.) Rehder syn. *S. sorbifolia* A.Br., *Spiraea sorbifolia* sensu Hook.f. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 231).

Kaempferol-3 β -D-galactopyranoside (trifolin), mp. 230°, quercetin-3-xyloside and kaempferol-3-xyloside isolated (*Khim. Prir. Soedin.* 1968, 4, 379; *Chem. Abstr.* 1969, 70, 84949 x).

SORBUS (Rosaceae)

S. aucuparia L. syn. *Pyrus aucuparia* Gaertn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 231).

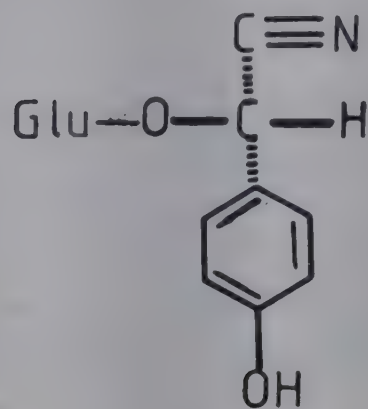
Lupeol, betulin and 23-hydroxybetulin from bark (*J. Chem. Soc. C* 1960, 4303); aucuparin (3,5-dimethoxy-4-hydroxybiphenyl), mp. 101°, and methoxyaucuparin (2',3,5-trimethoxy-4-hydroxybiphenyl), mp. 120°, from heartwood (*Acta Chem. Scand.* 1961, 15, 1796); a new lignan xyloside (I) isolated from sapwood (*Acta Chem. Scand.* 1962, 16, 518); juice of berries heated with sulphuric acid yielded L(+) parasorbic acid (*Collect. Czech. Chem. Commun.* 1962, 27, 735); absolute configuration of parasorbic acid (sorbin oil) from fruits (*Chem. Ber.* 1962, 95, 2009).

NEW COMPOUNDS**SORGHUM** (Poaceae)

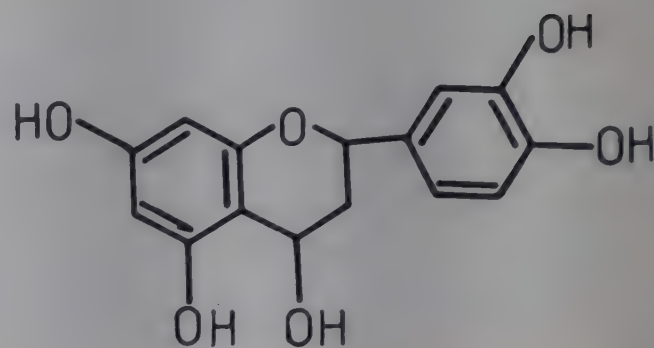
S. bicolor (L.) Moench. syn. *S. vulgare* (L.) Pers., *Andropogon sorghum* Brot. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 231).

A new cyanogenetic glucoside - dhurrin (p-hydroxymandelonitrile) mp. 163° - was alkali-labile (*J. Org. Chem.* 1965, 30, 603); improved method for isolation of dhurrin (*Phytochemistry* 1965, 4, 297); leuteoforol (3',4,4',5,7-pentahydroxyflavan) isolated (*Phytochemistry* 1969, 8, 1803).

NEW COMPOUNDS



Dhuririn



Leuteoforol

S. vulgare (L.) Pers.; see *S. bicolor* (L.) Moench.

SPHAERANTHUS (Asteraceae)

S. indicus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 232).

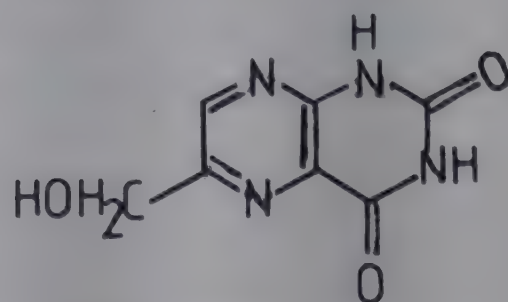
Methyl chavicol, α -ionone, d-cadinene, p-methoxycinnamaldehyde as major constituents and α -terpinene, citral, geraniol, geranyl acetate, β -ionone, sphaerene, indicusene and sphaeranthol as minor constituents of essential oil (*Perfum. Essent. Oil Record*. 1959, 50, 765; *Chem. Abstr.* 1960, 54, 7980 g); β -sitosterol, n-triacontanol, phenylurethan, n-pentacosane from oil (*Proc. Nat. Acad. Sci. India* 1963, 33A, 349; *Chem. Abstr.* 1964, 60, 2040 e).

SPINACIA (Chenopodiaceae)

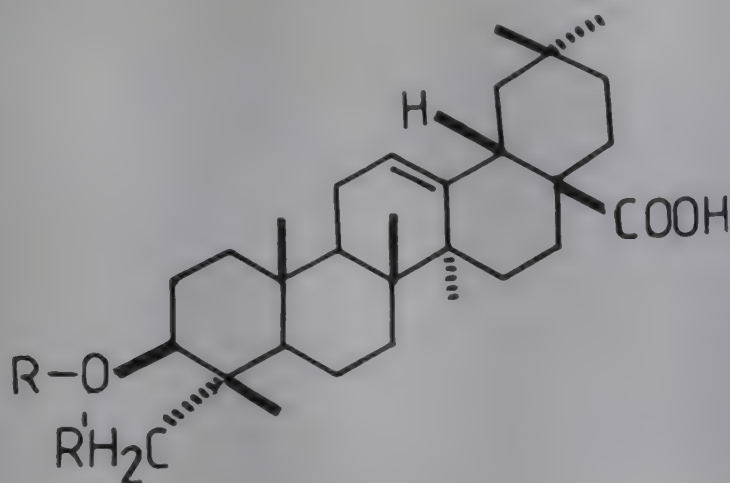
S. oleraceae L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 232).

Patuletin (quercetagenin-6-methylether), mp. 261° and spinacetin (quercetagenin-3',6'-dimethylether), mp. 235°, isolated from leaves (*J. Org. Chem.* 1961, 26, 4718); 6-hydroxymethylumazine isolated (*J. Biochem.* 1966, 60, 335); spinasaponins A and B isolated from roots and characterised as 3-O-[β -D-glucopyranosyl](1 \rightarrow 3)- β -D-glucuronopyranosyl]-3 β -hydroxyolean-12-en-28-oic acid and corresponding derivative of hederagenin respectively (*Ann. Chem.* 1969, 726, 125).

NEW COMPOUNDS



6-Hydroxymethylumazine



Spinasaponin A

R = Glu(1→3)Glu, R' = H

Spinasaponin B

R = Glu(1→3)Glu, R' = OH

SPIRAEA (Rosaceae)

S. sorbifolia L.; see *Sorbaria tomentosa* (Lindl.) Rehder

SPREKELIA (Amaryllidaceae)

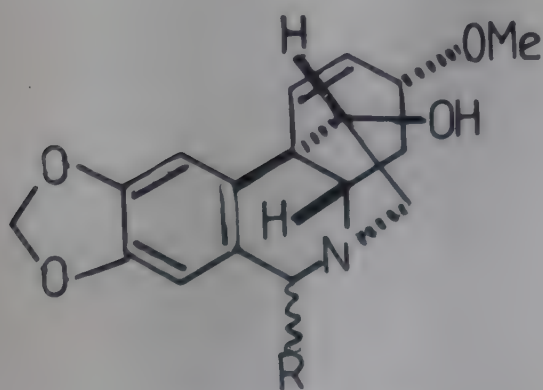
S. formosissima (L.) Herb.

Eng. - Jacobean lily, St. James lily.

Ismine, haemanthamine, haemanthidine, pretazettine and 3-epimacronine from bulbs (*Pharmazie* 1967, 22, 725; *Chem. Abstr.* 1968, 69, 19337 m); structure of pretazettine (*Tetrahedron Lett.* 1968, 1307); crystal structure of haemanthamine (*J. Am. Chem. Soc.* 1970, 92, 6337).

Distribution : Grown in gardens as ornamental.

NEW COMPOUNDS

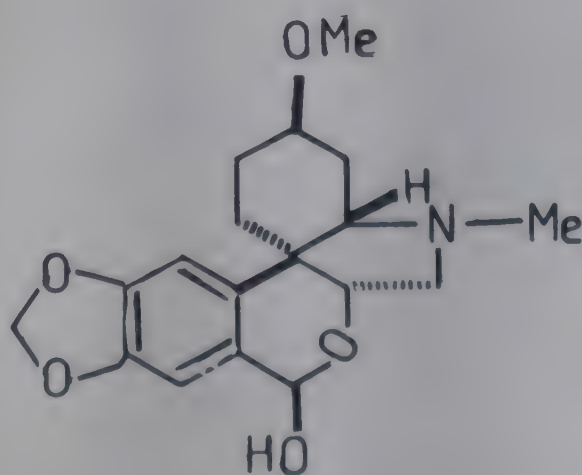


Haemanthidine

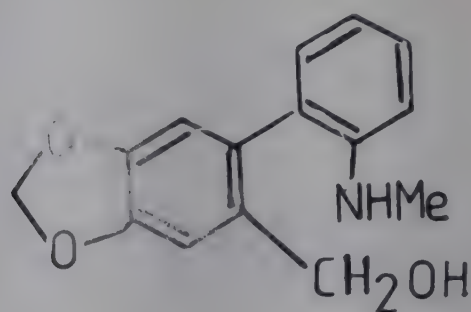
R = OH

Haemanthamine

R = H



Pretazettinettine



Ismine

STELLARIA (Caryophyllaceae)*S. graminea* L.

Alkaloids (0.06%) isolated (*Izuch i Is'polz. Lekarstv. Resursov SSSR Sb.* 1964, 262; *Chem. Abstr.* 1965, 62, 13514 a).

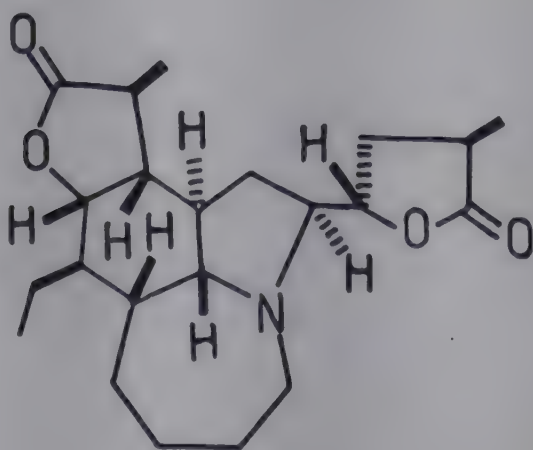
Distribution : Western Himalayas from Kashmir to Kumaon, alt. 3300-5100 m.

STEMONA (Stemonaceae)*S. tuberosa* Lour.

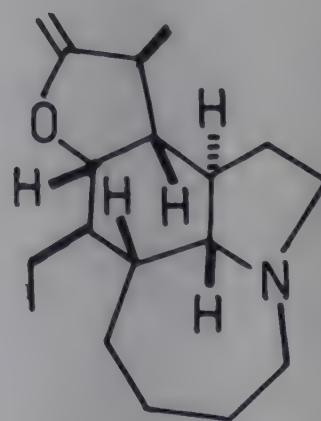
Tel. - Kaniputeega, Ijedigadda.

Tuberostemonine, mp. 86°, from roots (*Itsuu Kenkyushu Nempo* 1958, 9, 48; *Chem. Abstr.* 1960, 54, 599 c); structure elucidation of tuberostemonine (*Tetrahedron Lett.* 1961, 707); five alkaloids isolated from roots; tuberostemonine and stenine characterised (*Pharmazie* 1968, 23, 342; *Chem. Abstr.* 1968, 69, 74480 c); absolute configuration of stenine (*Chem. Commun.* 1967, 460); crystal structure of tuberostemonine (*Chem. Commun.* 1967, 460).

Distribution : North Tamil Nadu, coastal Andhra Pradesh and Arunachal Pradesh upto 1200 m.

NEW COMPOUNDS

Tuberostemonine



Stenine

STENOLOBIUM (Bignoniaceae)

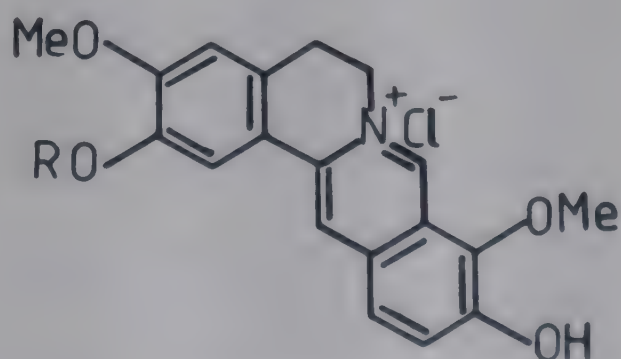
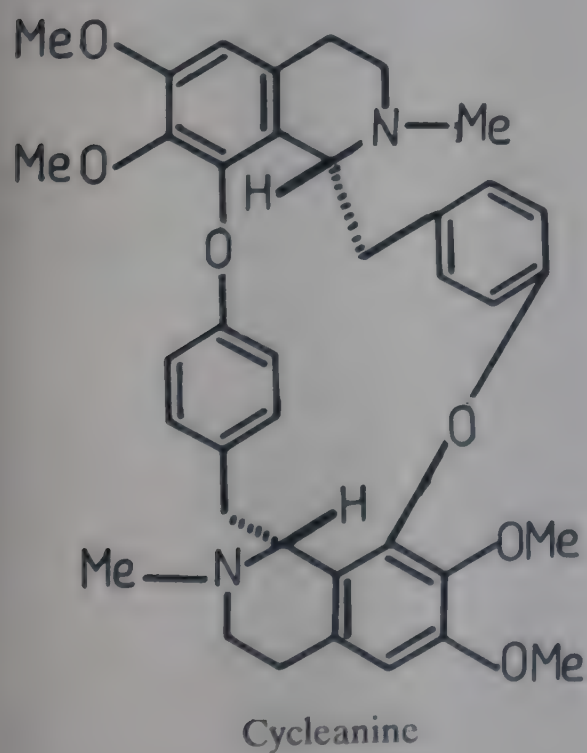
S. stans (L.) D. Don.; see *Tecoma stans* (L.) Juss. ex H. B. & K.

STEPHANIA (Menispermaceae)

S. glabra (Roxb.) Miers syn. *S. rotunda* sensu Hook.f. & Thoms. p.p. (non Lour.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 234).

Stepharine, mp. 179°, compound II, mp. 127°, stepharotine (as hydrobromide, mp. 227°) along with (-)tetrahydropalmatine, isolated from tubers of Indian plant whereas the last compound and cycleanine obtained from plants grown in Caucasus on coast of Black Sea (*Chem. Ind.* 1964, 282; *Khim. Prir. Soedin.* 1965, 1, 271; *Chem. Abstr.* 1966, 64, 6709 c; *Yakugaku Zasshi* 1966, 86, 460; *Chem. Abstr.* 1966, 65, 10633 h; *J. Org. Chem.* 1968, 33, 2785; Fr. 1,535,720 (1968) Aug. 9; *Chem. Abstr.* 1969, 71, 109924 w; *Tetrahedron Lett.* 1965, 2325); revised structure of rotundine and its identity with tetrahydropalmatine (*Chem. Pharm. Bull.* 1965, 13, 522); alkaloid A, mp. 79°, alkaloid C, mp. 182° and alkaloid D, mp. 153°, from bulbs (*Khim. Prir. Soedin.* 1965, 392; *Chem. Abstr.* 1966, 64, 14236 f); hyndarine and cycleanine from bulbs; cycleanine and a base, mp. 204°, from grass (*Aptech. Delo* 1965, 14, 19; *Chem. Abstr.* 1966, 64, 7965 e); tuduranine isolated from root tuber; its synthesis from stepharine (*Yakugaku Zasshi* 1966, 86, 871; *Chem. Abstr.* 1967, 66, 28947 a); dehydrocorydalmine chloride and a new protoberberine alkaloid - stepharanine - from tubers (*J. Org. Chem.* 1967, 32, 3253); isolation of (+)pronuciferine, (+)stepharine, (-)corydalmine and (-)stepholidine and chemical studies (*Tetrahedron Lett.* 1965, 2325; *J. Org. Chem.* 1968, 33, 2785).

Note: Hook.f. in Fl. Brit. India 1, 103, 1872 treated *S. glabra* (Roxb.) Miers under *S. rotunda* Lour. But plant of Loureio is distinct and appears to be confined to Cochin-China (*Viet Nam*) only (*Diels in Das Pflanzenreich*, 46, 271, 1910). For sake of convenience references pertaining to title plant *S. glabra* and *S. rotunda* are given under *S. glabra* (Roxb.) Miers since no author citations are provided in publications (abstracts) to know precise status of the plants.

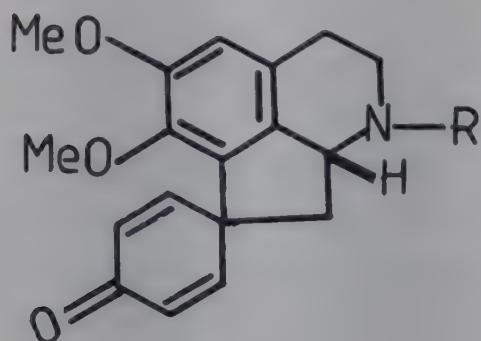
NEW COMPOUNDS

Dehydrocorydalmine

R = Me

Stepharanine

R = H

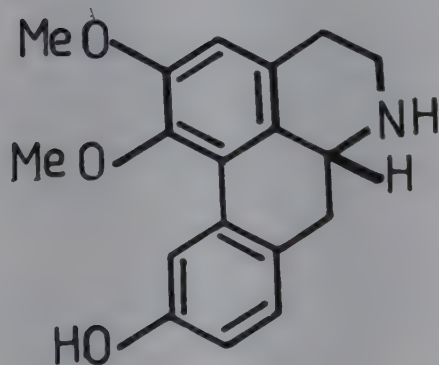


Stepharine

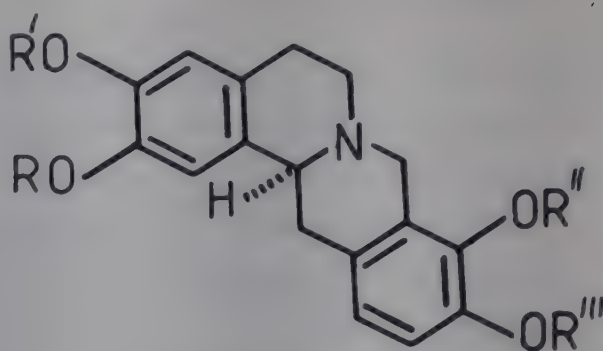
R = H

Pronuciferine

R = Me



Tuduranine



Stepholidine

R,R''' = H, R',R'' = Me

Corydalmine

R,R',R'' = Me, R''' = H

Rotundine

R,R',R'',R''' = Me

BIOLOGICAL ACTIVITY

Rotundine had neuro-sedative action similar to but weaker than that of chlorpromazine in rats and mice. Its toxicity was 33-50% that of chlorpromazine (*Acad. Rep. Pop. Rom. Stud. Cercet. Fiziol* 1962, 7, 217; *Chem. Abstr.* 1963, 58, 14593 d); base, mp. 204°, had anticholinesterase and cycleanine had antiinflammatory properties (*Aptech. Delo* 1965, 14, 19; *Chem. Abstr.* 1966, 64, 7965 e).

S. hermandifolia (Willd.) Walp.; see *S. japonica* (Thunb.) Miers

S. japonica (Thunb.) Miers syn. *S. hermandifolia* (Willd.) Walp. & sensu Hook.f. & Thoms; *S. rotunda* sensu Hook.f. & Thoms. p.p. (non Lour.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 234).

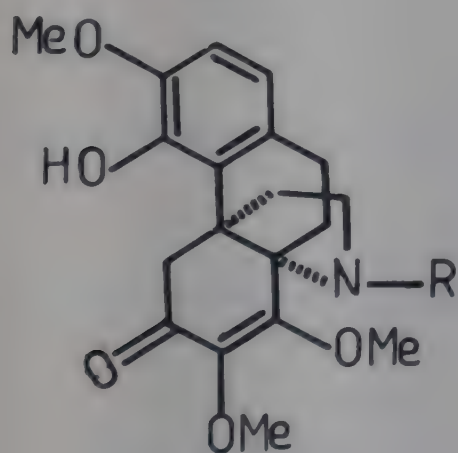
Steponine isolated (*Nippon Yakurigaku Zasshi* 1958, 54, 1093; *Chem. Abstr.* 1960, 54, 3727 h); protostephanine, mp. 72°, obtained chemically from bromoprotostephanine (*Itsuu Kenkyushu Nempo* 1958, 9, 33; *Chem. Abstr.* 1960, 54, 1580 c); fangchinoline, mp. 238°, dl-tetrandrine, mp. 257°, d-tetrandrine, mp. 217° and d-isochondrodendrine, mp. 309°, isolated from roots (*J. Pharm. Sci.* 1961, 50, 819); an amorphous alkaloid as O-acetyl derivative, mp. 113°, from aerial parts (*Aptech. Delo* 1965, 14, 19; *Chem. Abstr.* 1966, 64, 7965 e); a new alkaloid - hernandoline (aknadine) - from herb (*Khim. Prir. Soedin.* 1967, 3, 106; *Chem. Abstr.* 1967, 67, 43966 v); new alkaloids - aknadine, mp. 133°, aknadine, mp. 70°, aknadine,

mp. 156° and a compound mp. 66° - from roots and rhizomes (*Indian J. Chem.* 1967, 5, 281; *J. Inst. Chemists*, Calcutta 1967, 39, 265; *Chem. Abstr.* 1968, 68, 46999 q; *Chem. Ind.* 1969, 1178); estimation of aknadine in roots and rhizomes by TLC (*Indian J. Pharm.* 1967, 29, 180); isolation and structure elucidation of new alkaloid - 4-demethylhasubanonine (aknadinine) - from roots (*J. Org. Chem.* 1968, 33, 4529); crystal structure of aknadinine (*J. Chem. Soc. Perkin 2*, 1972, 1280).

Note: Hook.f. & Thoms. in *Fl. Ind.* 198, 1855 & in *Fl. Brit. India* 1, 103, 1872 treated *S. glabra*, *S. japonica* & *S. roxburghiana* under *S. rotunda* Lour. On the other hand Diels in *Pfreich.* 46, 272, 1910 treated these taxa as distinct species but kept *S. roxburghiana* under synonymy of *S. hermandifolia* (Willd.) Walp. Recently Forman (*Kew Bull.* 1956, 49, 58, 1958) reduced *S. hermandifolia* (Willd.) Walp. to *S. japonica* (Thunb.) Miers var. *discolor* (Miq.) Forman and *S. hermandifolia* sensu Hook.f. & Thoms. to *S. japonica* (Thunb.) Miers var. *japonica*. In India var. *japonica* is found in Western Ghats, Nilgiris and Palni Hills, whereas var. *discolor* is found in Himalayas, Assam, West Bengal, Orissa and northern parts of Andhra Pradesh.

A number of investigators have reported their findings under two title plants, *S. japonica* and *S. hermandifolia*. Since it is not possible to ascertain the correct status of the plants used in their investigations, the findings, for the sake of convenience are given under *S. japonica*.

NEW COPOUNDS

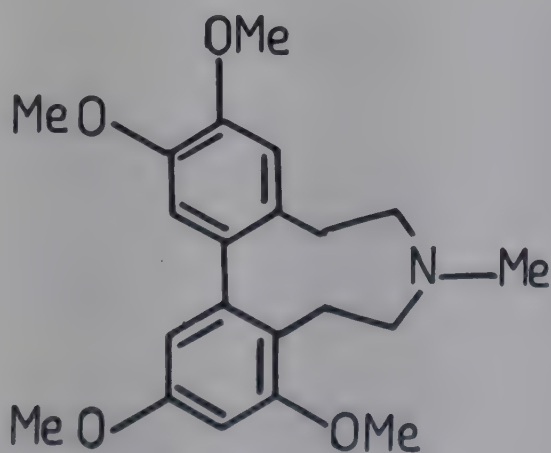


Aknadinine

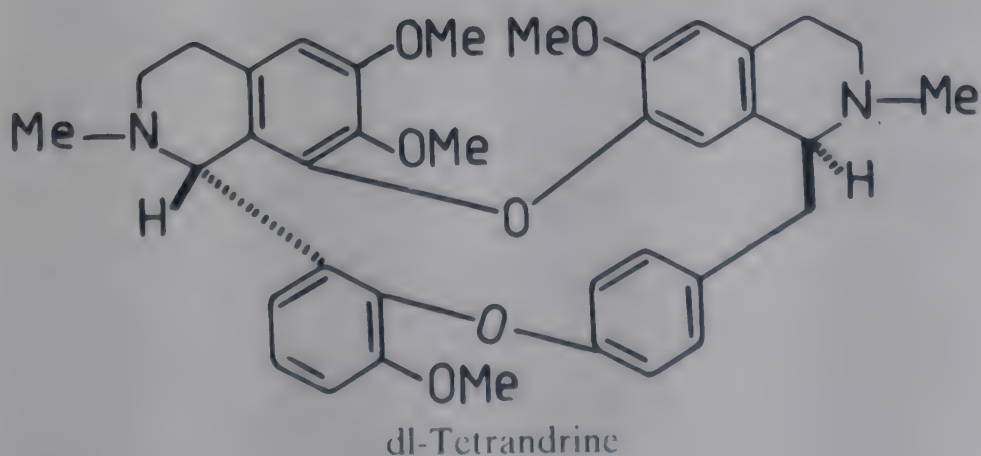
R = Me

Aknadicine

R = H



Protostephanine



dl-Tetrandrine

BIOLOGICAL ACTIVITY

Steponine had LD₅₀ 0.79 mg/10g i.p., in mice (*Nippon Yakugaku Zasshi* 1958, 54, 1093;

Chem. Abstr. 1960, 54, 3727 h).

S. rotunda Lour.; see *S. glabra* (Roxb.) Miers, *S. japonica* (Thunb.) Miers

STEPHEGYNE (Rubiaceae)

S. parviflora Korth.; see *Mitragyna parviflora* (Roxb.) Korth.

STERCULIA (Sterculiaceae)

S. alata Roxb.; see *Pterygota alata* (Roxb.) R.Br.

STEREOCAULON (Stereocaulaceae)

S. foliolosum Nyl. var. *strictum* (Bab.) M. Lamb.

Atranorin (0.25), stictic acid (0.22%) and D-arabitol obtained (*J. Sci. Ind. Res.* 1961, 20B, 166).

Distribution : Throughout Himalayas.

S. myriocarpum Th. Fr. var. *orizabe* Th.Fr.

Atranorin (0.7), myriocarpic (0.2), stictic (0.25) and ventosic (0.18) acids, and D-arabitol (0.5%) isolated (*J. Sci. Ind. Res.* 1961, 20B, 166).

Distribution : Alpine regions of Himalayas.

STEREOSPERMUM (Bignoniaceae)

S. colais (Buch.-Ham. ex Dillw) Mabber. syn. *S. suaveolens* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 234).

Plant extract showed anticancer activity in Walker 256 tumor system.

Lapachol [2-hydroxy-3-(3-methyl-2-butenyl)-1,4-naphthoquinone] isolated (*Cancer Res.* 1968, 28, 1952).

BIOLOGICAL ACTIVITY

Lapachol showed highly significant activity against Walker 256 carcinosarcoma (*Cancer Res.* 1968, 28, 1952).

S. suaveolens DC.; see *S. colais* (Buch.-Ham. ex Dillw) Mabber.

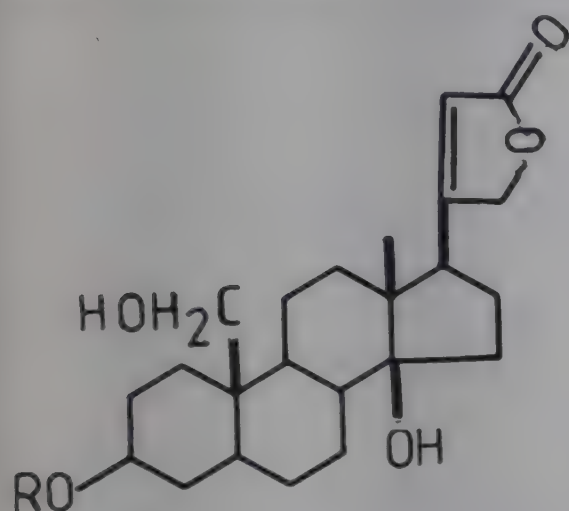
STREBLUS (Moraceae)

S. asper Lour. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 235).

Root bark extract showed definite action on myocardium (*Indian J. Med. Sci.* 1964, 18, 191). Kamalosite, mp. 174°, asperosite, mp. 198°, indrosite, mp. 222°, lucknoside, mp. 253° and compound F, mp. 175°, along with amorphous glycosides G, G' and H isolated from root bark (*Helv. Chim. Acta* 1962, 45, 1515); cannodimethoside, strophalloside, mp. 163°, glucogitodimethoside, strophanolloside, mp. 172°, glucokamalosite, mp. 258°, sarmethoside and glucostreblosite, mp. 244°, separated by PC and their structures elucidated (*Helv. Chim.*

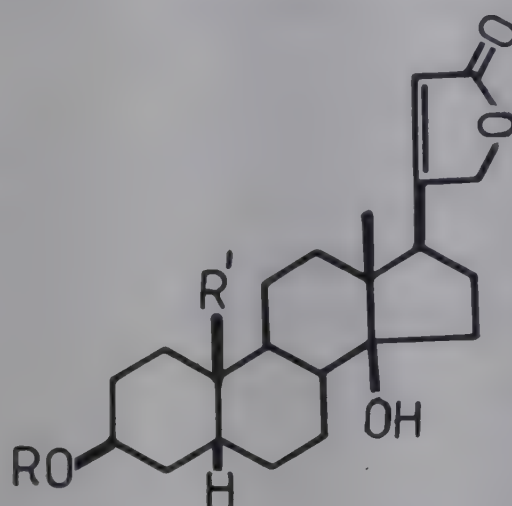
Acta 1964, 47, 2303, 2320).

NEW COMPOUNDS



Cannodimethoside

R = 2,3-di-O-methylglucose

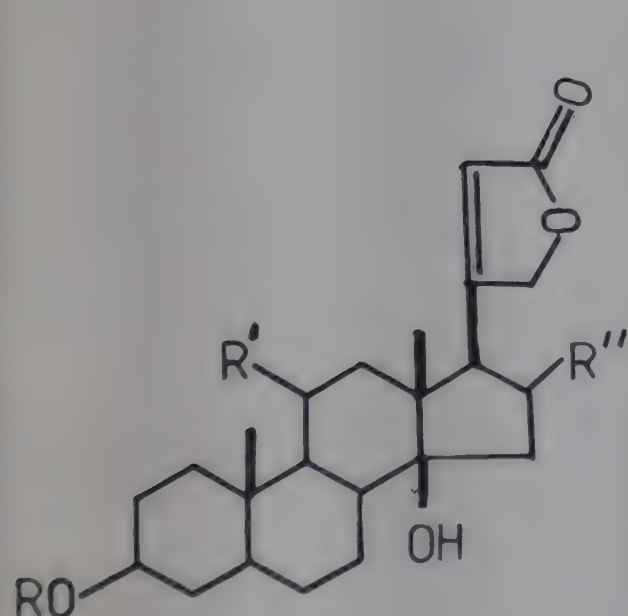


Glucokamaloside

R = Glu→2,3-di-O-methyl-D-fucose, R' = Me

Glucostrebloside

R = Glu→2,3-di-O-methyl-D-fucose, R' = CHO



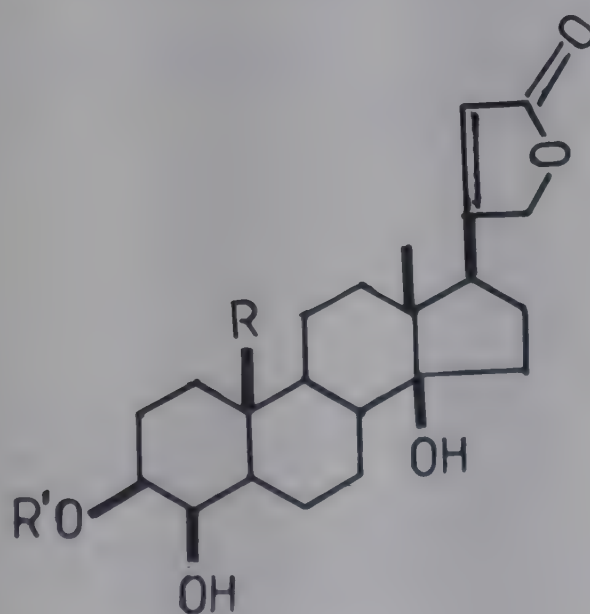
Gluco-gitodimethoside

R = Glu→2,3-di-O-methylglucose,

R' = H, R'' = OH

Sarmethoside

R = 3-O-methyl-D-glu, R' = α-OH, R'' = H



Strophanolloside

R = CH₂OH, R' = 6-Deoxyallose

Strophalloside

R = CHO, R' = 6-Deoxyallose

BIOLOGICAL ACTIVITY

Compound, mp. 160°, induced positive inotropic effect at 10 µg diln. and systolic response at 100 µg diln. in isolated frog heart. It produced tonic contractions in rabbit intestine and guinea pig uterus in vitro at diln. of 0.05 µg to 0.5 µg. LD₅₀ in mice was 4.8 mg/kg. In urethane-anaesthetised rabbits, doses between 0.05 µg and 0.5 µg induced prolonged hypotensive response preceded by acute pressor effect with increased respiratory rate; 0.5 µg dose

was lethal (*Curr. Sci.* 1961, 30, 420); an amorphous cardenolide (100 μ g) produced increased force of contraction in isolated rabbit heart comparable to 0.5 μ g of adrenaline but effect was much more prolonged than that of latter (*Indian J. Med. Sci.* 1964, 18, 191).

STRICTOCARDIA (Convolvulaceae)

S. tiliifolia (Desr.) Haillier f. syn. *Argyreia tiliifolia* Wight

Sterolin, mp. 255° and β -sitosterol glucoside from seeds (*Bull. Calcutta Sch. Trop. Med.* 1962, 10, 170; *Chem. Abstr.* 1963, 59, 9081 b).

Distribution : Coastal regions of India.

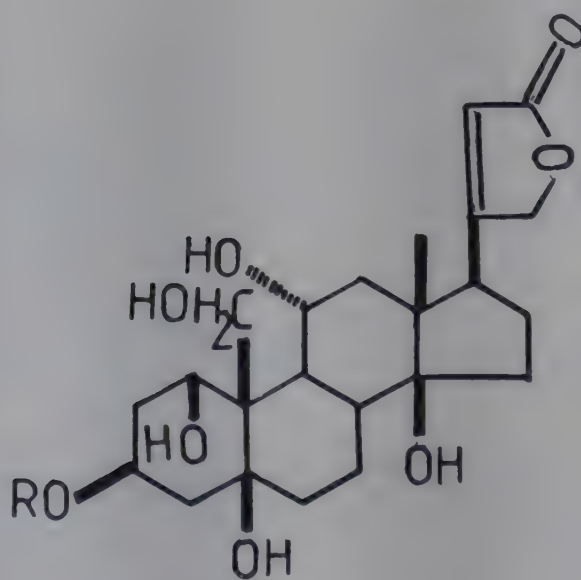
STROPHANTHUS (Apocynaceae)

S. gratus Franch.

Besides ouabain, three other cardenolides separated by PC and chemical studies done (*Pharmazie* 1960, 15, 81; *Chem. Abstr.* 1960, 54, 13542 h); sarmentoside A, sarmentoside E, acolongifloroside K, mp. 179° and five new compounds along with ouabain (4-8%), mp. 188°, from seeds (*Helv. Chim. Acta* 1965, 48, 202); detection of thirty cardenolides by PC; ouabain was predominant compound followed by acolongifloroside K and strogoside, mp. 211° (*Helv. Chim. Acta* 1967, 50, 179).

Distribution : Native of tropical Africa, grown as an ornamental plant in gardens.

NEW COMPOUNDS



Ouabain

R = Rha

Acolongifloroside K

R = 6-deoxy-L-talose

BIOLOGICAL ACTIVITY

LD50 of ouabain in guinea pigs increased with increase in volume of infusion but not with duration of infusion (*Experientia* 1962, 18, 470). Toxic effects of ouabain on single purkinje fibres and ventricular muscle fibres investigated in vitro by microelectrode technique; majority of purkinje fibre preparations developed extrasystoles and rapid spontaneous rhythms (*Am.*

J. Physiol. 1962, 203, 433). In isolated right auricle of rabbit, previously fatigued by electric stimulation for 3-4 hours, heparin exerted considerable protective action against toxicity of ouabain added to bath (*C.R. Soc. Biol.* 1962, 156, 1327; *Chem. Abstr.* 1963, 58, 7259 e).

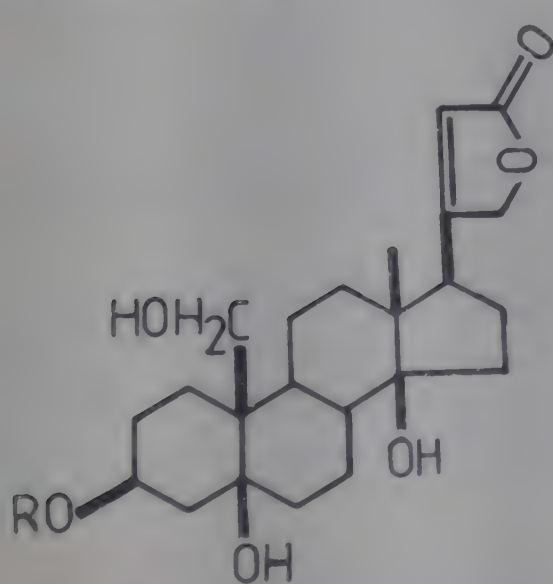
Isometric systolic tension was measured in papillary muscle of cat heart at 27°, 37° and 41°, before and after administration of g-strophanthin (ouabain). It was assumed that induction of hypothermia, as such, compensated for failure of papillary muscles which was necessary for action of cardiac glycosides (*Arch. Exp. Pathol. Pharmacol.* 1962, 242, 409; *Chem. Abstr.* 1962, 57, 3967 a). g-Strophanthin LD/100 g in guinea pigs was 37 ± 4 r. Toxicities of g-strophanthin, euphylline and hydroxyethyltheophylline were additive (*Acta Biol. Med. Ger.* 1962, 8, 511; *Chem. Abstr.* 1963, 58, 14593 f).

S. kombe oliver

Cymarin (strophanthidin- β -D-digitoxoside), periplocymarin, cymarol, emicymarin and helveticoside isolated: strophanthidin digitoxosidoglycoside (15-25%) together with k-strophanthoside and k-strophanthin- β from unfermented seed extract (*Helv. Chim. Acta* 1960, 43, 593; *Naturwiss.* 1959, 46, 670; *Chem. Abstr.* 1964, 60, 5885 e); "strophanthin" (k-strophanthin- β) from seeds was separated into erysimoside (strophanthidin digitoxosidoglucoside) and erysimosol (strophanthidol digitoxosidoglucoside) by chromatography; new glycosides - glucocymarol and glucoerysimoside - also isolated (*Ann. Chem.* 1961, 643, 192); preparation of strophanthidin digitoxoside (helveticoside), mp. 170°, from seeds (Ger. 1,082,007 (1960) May 19; *Chem. Abstr.* 1961, 55, 12785 c).

Distribution : Native of tropical Africa. Introduced into India in gardens as ornamental plant.

NEW COMPOUNDS

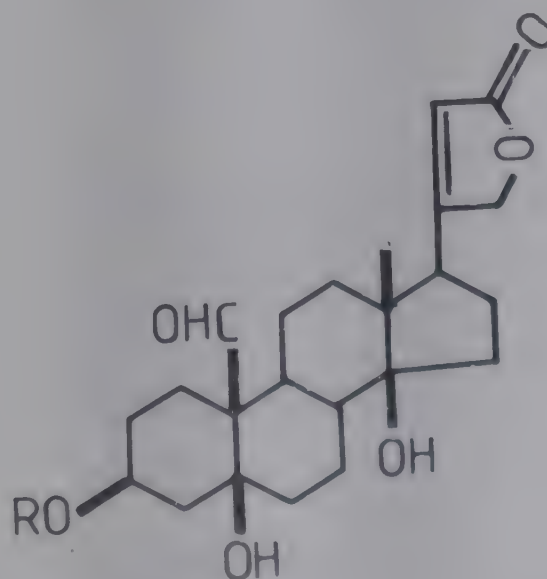


Erysimosol

R = Digilanidobiose

Glucocymarol

R = Strophanthobiose

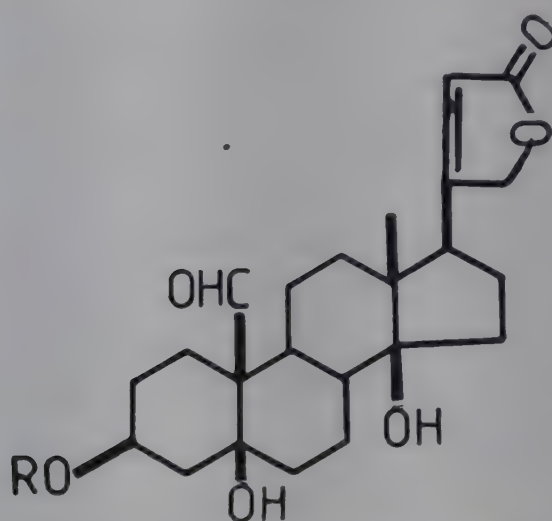


Erysimoside

R = Digilanidobiose

Glucoerysimoside

R = Glucodigilanidobiose



Strophanthidin digitoxoside

R = Digitoxose

BIOLOGICAL ACTIVITY

Cymarine had LD₅₀ 0.076-0.118 mg/kg i.v. in cats (*Naturwiss.* 1959, 46, 670; *Chem. Abstr.* 1964, 60, 5885 e). Strophanthidin digitoxoside (helveticoside) was useful in heart diseases (Ger. 1,082,007 (1960) May, 19; *Chem. Abstr.* 1961, 55, 12785 c). In cats k-strophanthin and strophanthidin genins such as erysidimine given i.v. intensified muscular contraction at 0.1-0.2 mg/kg and caused paralysis at 1-2 mg/kg. At 0.1-0.2 mg/kg erysidimine was synergistic with proserine and antagonistic to d-tubocurarine paralysis (*Farmakol. Toksikol.* 1961, 24, No. 1; *Chem. Abstr.* 1961, 55, 14726 b). Adenosine triphosphatase activity was measured in cortical and medullary parts of kidney in the absence and presence of strophanthin; latter inhibited the activity and affected distribution of glucose and Na⁺ (Dokl. Akad. Nauk. Arm. SSSR 1962, 35, 177; *Chem. Abstr.* 1963, 58, 11851 f). Convallatoxin and acetyl strophanthidin were administered to dog heart-lung preparation. The inotropic effect, followed by measurement of arterial pressure at constant venous supply, reached a maximum about 10 minutes after injection of the two glycosides (*Acta Physiol. Scand.* 1962, 55, 139; *Chem. Abstr.* 1962, 57, 13129 a). Erysimosol (0.03-0.04 mg/kg) had a sedative effect and increased heart-beat frequency in cats by 15-20%; higher doses caused symptoms of poisoning. Highest tolerated dose was 0.04 mg/kg, lowest toxic dose was 0.05 mg/kg and lowest LD 0.12 mg/kg i.v. In small doses it inhibited and in higher doses excited the central nervous system (*Farmakol. Farmakoter. Alkaloidov Glikozidov, Akad. Nauk. Uzb. SSR, Khim.-Tekhnol. Bibl. Otd.* 1966, 70; *Chem. Abstr.* 1967, 67, 62846 x).

Nature and mechanism of diuresis produced in dogs by strophanthidin investigated by infusion of drug into one renal artery. Saline loaded dogs responded to strophanthidin infusion with prompt fall in glomerular filtration rate and delayed saluresis and diuresis (*Am. J. Physiol.* 1961, 200, 373).

STRYCHNOS (Strychnaceae)

S. gaultheriana Pierre; see *S. malaccensis* Benth.

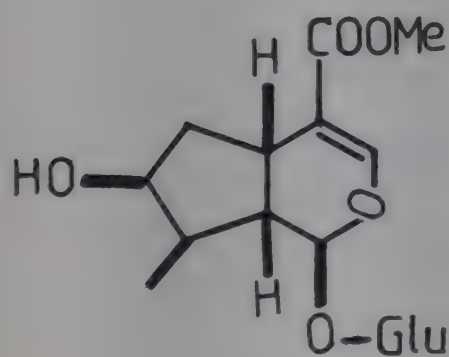
S. malaccensis Benth. syn. *S. gaultheriana* Pierre (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 236).

Brucine (1.55), strychnine (1.1), pseudostrychnine (1.13) and pseudobrucine (0.11%) isolated; pseudostrychnine occurred in two forms, mp. 236° and 263° , but had same optical rotation (*Naturwiss.* 1960, 47, 136; *Chem. Abstr.* 1961, 55, 2819 f).

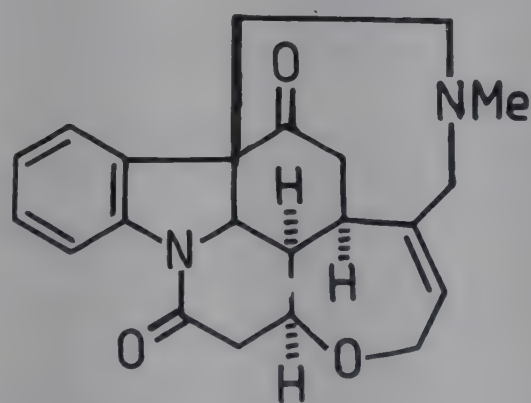
S. nux-vomica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 236).

Glucoside - loganin, mp. 222° - isolated from fruits (*Tetrahedron Lett.* 1961, 394); brucine, strychnine, vomicine and methoxystrychnine isolated from leaves and root bark; presence of C-mavacurine in roots (*Ann. Pharm. Fr.* 1965, 23, 93; *Chem. Abstr.* 1965, 63, 5447 g; *Helv. Chim. Acta* 1966, 49, 1; *J. Indian Chem. Soc.* 1967, 44, 663); detection of brucine, strychnine, pseudobrucine, α - and β -colubrines, vomicine and novacine by TLC (*Indian J. Pharm.* 1969, 31, 87); chemical studies on strychnine methosulphate (*Tetrahedron Suppl.* No. 8. 1966, 217).

NEW COMPOUNDS



Loganin



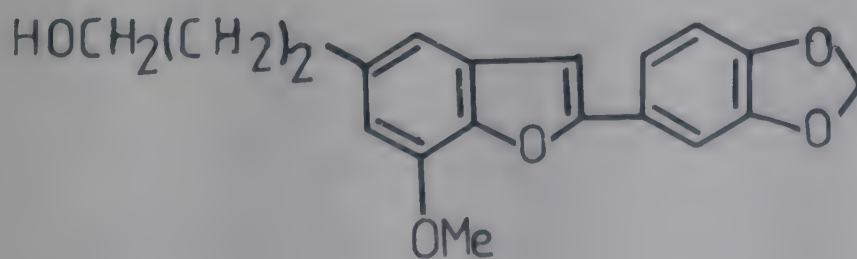
Vomicine

STYRAX (Styraceae)

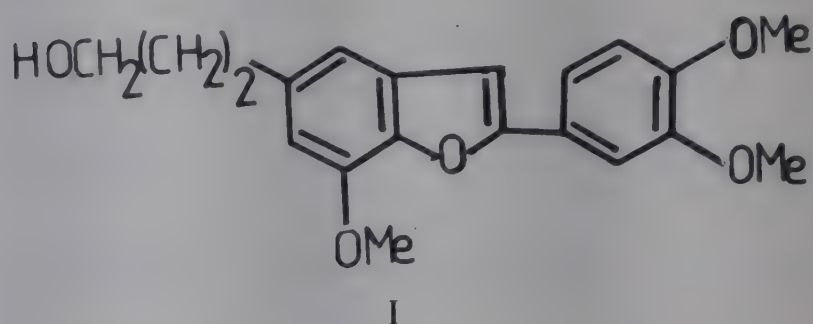
S. officinalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 236).

A new steroidal haemolytic and ichthyotoxic saponin isolated (*Harokeach Haivri* 1964, 10, 104; *Chem. Abstr.* 1965, 63, 3310 d); glycosidic fraction from seeds on hydrolysis yielded egonol and a new benzofuran derivative - 2-(3,4-dimethoxyphenyl)-5-(3-hydroxypropyl)-7-methoxybenzofuran (I) (*J. Chem. Soc. C* 1967, 2402).

NEW COMPOUNDS



Egonol

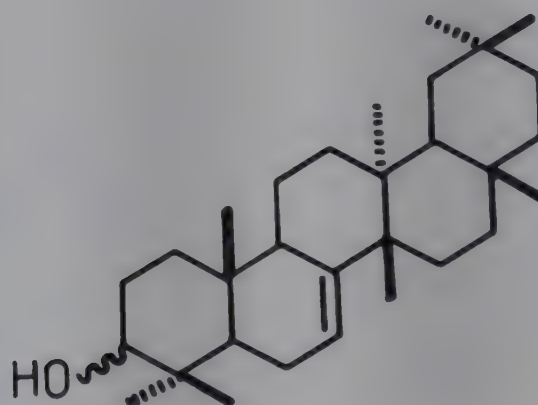


SUREGADA (Euphorbiaceae)

S. multiflora (Juss.) Baill. syn. *Gelonium multiflorum* Juss. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 124).

Isolation of multiflorenol, bauerenol and a new triterpene alcohol - epimultiflorenol - from bark (*Chem. Ind.* 1961, 945; *Indian J. Chem.* 1969, 7, 207); structure of multiflorenol elucidated (*Tetrahedron* 1963, 19, 123).

NEW COMPOUNDS



Multiflorenol (β -OH)

Epimultiflorenol (α -OH)

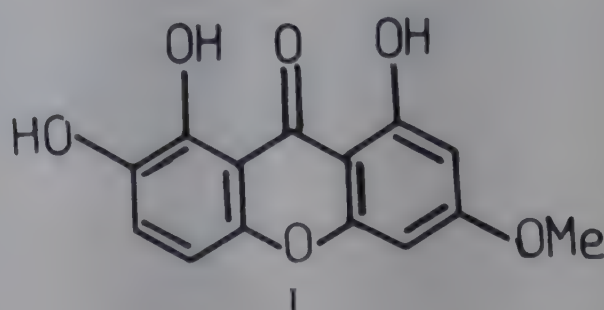
SWERTIA (Gentianaceae)

S. decussata Nimmo ex Grah.; see *S. densiflora* (Griseb.) Kashyapa

S. densiflora (Griseb.) Kashyapa syn. *S. decussata* Nimmo ex Grah. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 237).

1,7,8-Trihydroxy-3-methoxyxanthone (I) isolated (*Phytochemistry* 1969, 8, 1533).

NEW COMPOUNDS



S. perennis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 237).

1,8-Dihydroxy-3,7-dimethoxyxanthone isolated (*Phytochemistry* 1969, 8, 1535).

SWIDA (Cornaceae)

S. sanguinea (L.) Oplz syn. *Cornus sanguinea* L.

Rutoside, gallic and ellagic acid derivatives isolated from flowers; a flavonoid pigment appeared in leaves before it was found in flowers (*Bull. Soc. Chim. Biol.* 1961, 43, 661; *Chem. Abstr.* 1962, 56, 2713 a).

Distribution : Kashmir Himalayas, alt. 2000-2500 m.

SWIETENIA (Meliaceae)

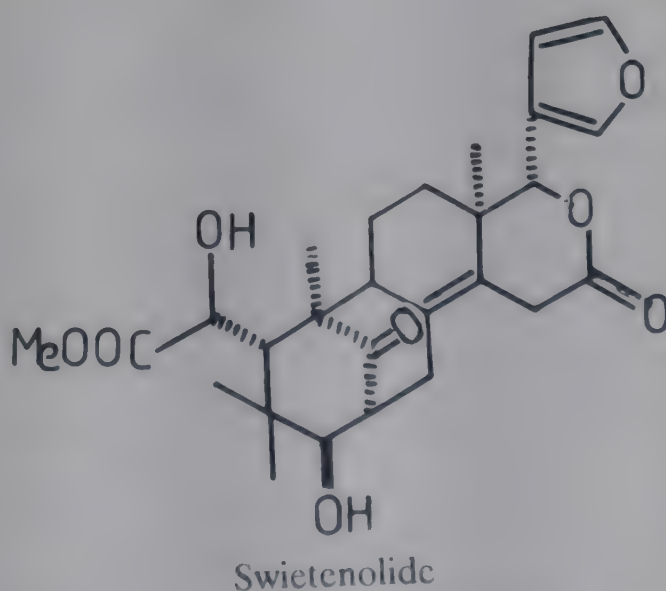
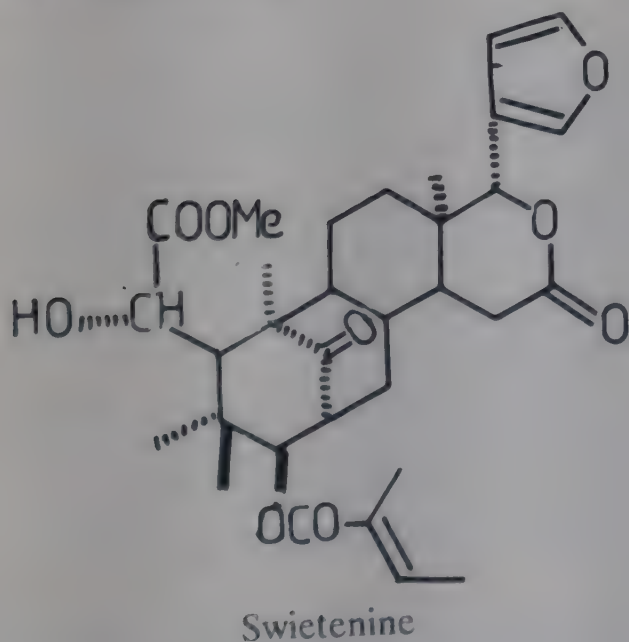
S. macrophylla King

B. Bara-mahagoni; Mal. - Mahagony; Eng. - Mahogany.

A novel tetranortriterpenoid - swietenine - isolated from seeds along with swietenolide; structure and absolute stereochemistry of former elucidated by X-ray analysis (*J. Indian Chem. Soc.* 1960, 37, 440; *Tetrahedron Lett.* 1964, 2593; *ibid.* 1965, 2937; *J. Chem. Soc. B* 1966, 318; *Tetrahedron* 1968, 24, 1503, 1507).

Distribution : Native of tropical America, Mexico and South America. Introduced into India in rain forests of south India, subsequently in West Bengal, Bihar, Orissa, Mysore, Kerala and Maharashtra.

NEW COMPOUNDS



S. mahagoni (L.) Jacq.

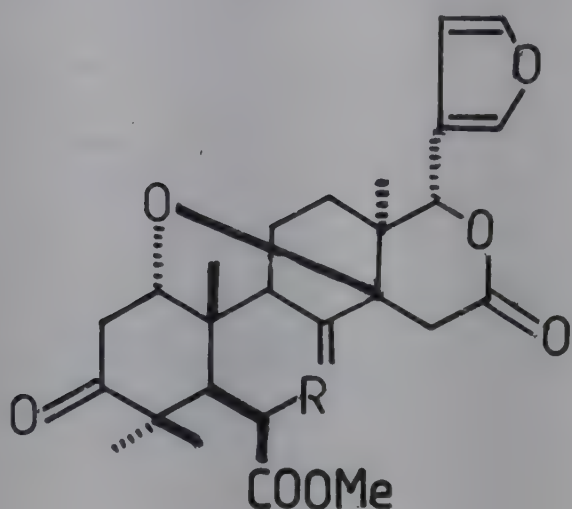
B. - Mahagoni; Tel. - Mahaagonichettu; Tam. - Mahagony, Ciminukku; Mal. Cheriamahagany, Mahagoni; Eng. - Mahogany.

Cyclocucalenol, mp. 135°, isolated from hardwood oil (*J. Org. Chem.* 1959, 24, 411); isolation and structure of mahoganin, mp. 225°, from seeds (*Tetrahedron Lett.* 1968, 5015; *Bull.*

Nat. Inst. Sci. India No. 37, 1968, 68; *Chem. Abstr.* 1969, 71, 61127 j); furanolactones - Me angolensate and Me 6-hydroxy-angolensate - from bark (*Chem. Commun.* 1969, 58); 7-deacetyl-7-oxogedunin from seeds (*J. Indian Chem. Soc.* 1969, 46, 682); 6-hydroxymethyl angolensate isolated (*J. Indian Chem. Soc.* 1969, 46, 273).

Distribution : Native of Central America. Introduced into India and grown in gardens and planted in forest localities of Maharashtra, Mysore, Kerala and elsewhere.

NEW COMPOUNDS

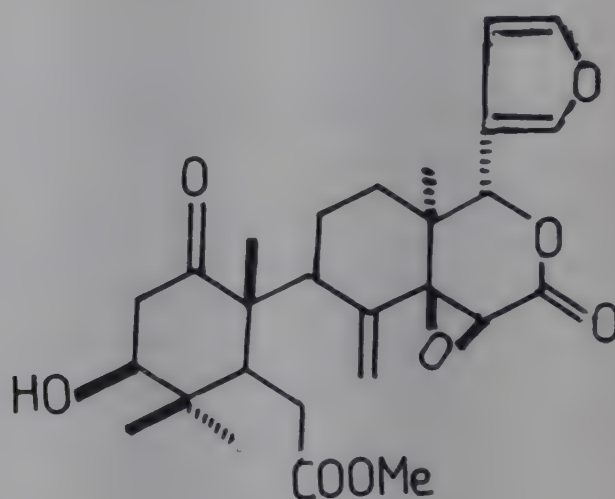


Me angolensate

R = H

Me 6-hydroxyangolensate

R = OH



Mahoganin

SYZYGIUM (Myrtaceae)

S. cumini (L.) Skeels syn. *Eugenia jambolana* Lam. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 238).

Anorexigenic activity of plant extract was approximately equal to that of amphetamine tartrate (*C.R. Acad. Sci. Paris, Ser. D* 1957, 264, 1350; *Chem. Abstr.* 1967, 66, 114288 t). Extractive of seeds showed hypoglycaemic activity on oral administration to normal rabbits, using tolbutamide as standard (*J. Pharm. Pharmacol.* 1961, 13, 381).

Acetyl oleanolic acid, two other triterpenoids, ellagic acid, isoquercitrin, quercetin, kaempferol and myricetin isolated from flowers (*J. Sci. Ind. Res.* 1962, 21B, 457).

S. jambos (L.) Alston syn. *Eugenia jambos* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 238).

Detection of alanine, glutamine, threonine, tyrosine, aspartic acid and cysteine in rose apple (*Sci. Cult.* 1964, 30, 505).

S. praecox (Roxb.) Rathakr. & Nair syn. *Eugenia wallichii* Wight

Dotriacontanol (laccerol) from leaves (*J. Indian Chem. Soc.* 1968, 45, 187).

Distribution : Sikkim, Khasi Hills, Assam, Bhutan and northern Bengal.

S. samarangense (Bl.) Merr. & Perry syn. *Eugenia javanica* Lamk. p.p.

H. & B.- Jamrul, Amrool; Tel. - Gulabi-jaamichettu, Gulabi- jaamikaayalu; Mal. - Paninir-champa.

Methyl betulinate and β -sitosterol from bark (*J. Indian Chem. Soc.* 1969, 46, 686).

Distribution : Native of Andaman and Nicobar Islands. Now found in different parts of India.

TABERNAEMONTANA (Apocynaceae)

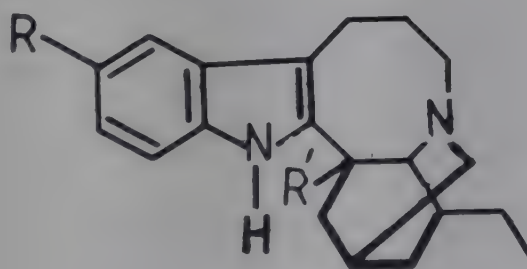
T. coronaria R. Br.; see *T. divaricata* (L.) R. Br. ex R. & S.

T. dichotoma Roxb.; see *Ervatamia dichotoma* (Roxb.) Blatter

T. divaricata (L.) R. Br. ex R. & S. syn. *T. coronaria* R. Br., *Ervatamia coronaria* Stapf., *E. divaricata* (L.) Alston (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 110).

Kaempferol from flowers (*Naturwiss.* 1959, 46, 401; *Chem. Abstr.* 1960, 54, 5635 h); ibogamine, voacangine, olivacine, dregamine, tabernaemontanine, voacamine and a new alkaloid - coronaridine - isolated (*J. Am. Chem. Soc.* 1960, 82, 1142).

NEW COMPOUNDS



Coronaridine

R = H, R' = COOMe

Ibogamine

R, R' = H

Voacangine

R = OMe, R' = α -COOMe

T. heyneana Wall.; see *Ervatamia heyneana* (Wall.) T. Cooke

T. wallichianum Steud.; see *Ervatamia wallichianum* Mehrotra & Rastogi Comb. nov.

TACCA (Taccaceae)

T. leontopetaloides (L.) O. Kuntze syn. *T. pinnatifida* Forst. & Forst.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 239).

β -Sitosterol, ceryl alcohol and taccalin (0.003%) isolated (*Lloydia* 1963, 26, 133).

T. pinnatifida Forst. & Forst.f.; see *T. leontopetaloides* (L.) O. Kuntze

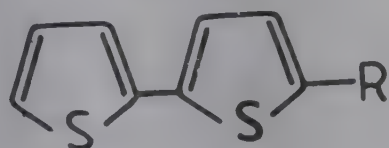
TAGETES (Asteraceae)*T. minuta* L.

Eng. - Stinking Roger.

Essential oil exhibited tranquillising, hypotensive, bronchodilatory, spasmolytic and anti-inflammatory activities (*Indian J. Med. Res.* 1969, 57, 864).

Isolation of α -terthienyl and two new bithienyl compounds - 5-(but-1-ol-3-ynyl)-2,2'-bithienyl (I), mp. 67° and 5-(but-1-chloro-2-ol-3-ynyl)-2,2'-bithienyl (II), mp. 55° (*Tetrahedron Lett.* 1964, 3159).

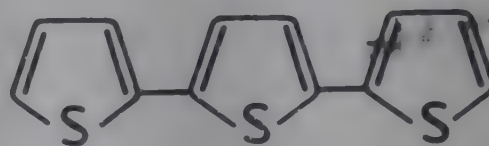
Distribution : Native of South America, naturalised in the north- western Himalayas, alt. 1250-2500 m.

NEW COMPOUNDS

I

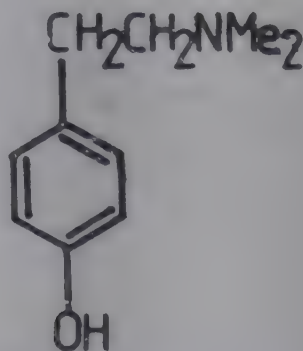
R = $\text{C}\equiv\text{CCH}_2\text{CH}_2\text{OH}$

II

R = $\text{C}\equiv\text{CCH}(\text{OH})\text{CH}_2\text{Cl}$  α -Terthienyl**TAMARINDUS (Caesalpinaceae)**

T. indica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 239).

Hordenine isolated from leaves, bark and flowers (*New Zealand J. Sci.* 1969, 12, 171; *Chem. Abstr.* 1969, 70, 90708 j).

NEW COMPOUNDS

Hordenine

TAMARIX (Tamaricaceae)

T. aphylla (L.) Karst. syn. *T. articulata* Vahl (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 239).

Quercetin and isoferulic acid isolated from leaves (*Indian J. Chem.* 1965, 3, 171).

T. articulata Vahl; see *T. aphylla* (L.) Karst.

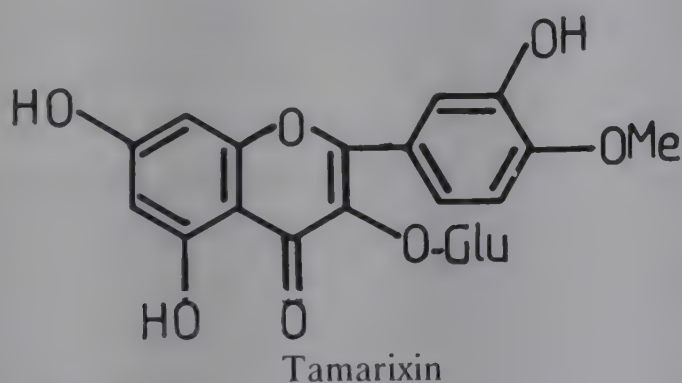
T. dioica Roxb. ex Roth (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 239).

Kaempferide, mp. 225°, tamarixetin, mp. 260°, and D-mannitol from leaves (*Indian J. Chem.* 1967, 5, 171).

T. indica Willd. syn. *T. gallica* sensu Dyer (non L.), *T. troupii* Holle (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 239).

3,3'-Dimethyl ether of ellagic acid, mp. 335°, isolated from roots (*Indian J. Chem.* 1965, 3, 48); a glycoside - tamarixin - isolated (*Indian J. Chem.* 1965, 3, 171).

NEW COMPOUNDS



T. gallicha L.; see *T. indica* Willd.

T. troupii Holle; see *T. indica* Willd.

TARAXACUM (Asteraceae)

T. officinale Weber ex Wigg. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 239).

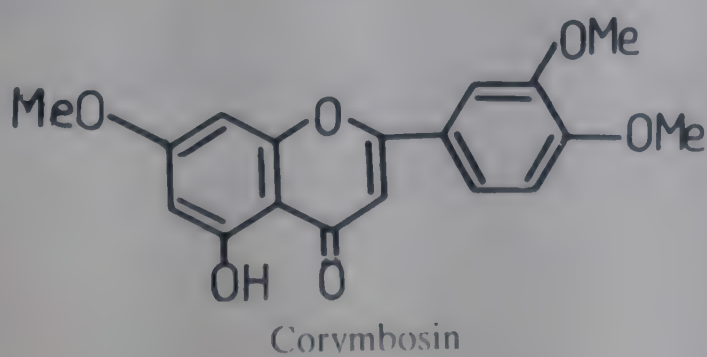
Free amino acids detected by PC; tryptophan found absent (*Bull. Soc. Sci. Bretagne* 1963, 38, 225; *Chem. Abstr.* 1965, 63, 3309 c); taraxien and taraxanthin dipalmitate from flowers (*Phytochemistry* 1964, 3, 229).

TARENNA (Rubiaceae)

T. asiatica (L.) Kuntze ex K. Schum. syn. *Webera corymbosa* Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 240).

Corymbosin, mp. 188°, isolated from leaves (*Tetrahedron Lett.* 1967, 4579).

NEW COMPOUNDS



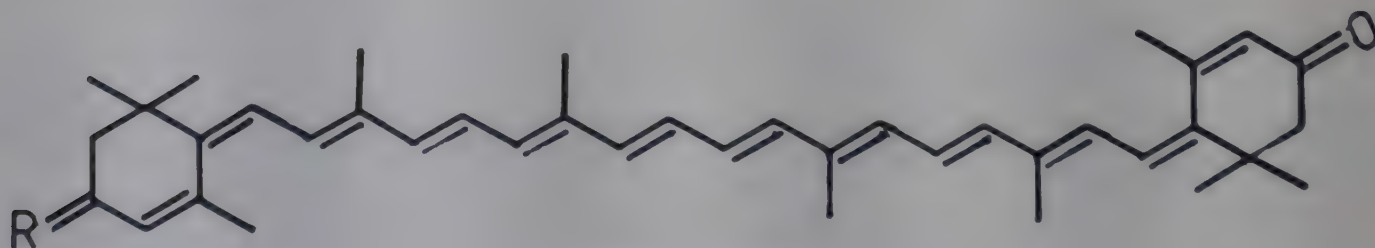
TAXUS (Taxaceae)

T. baccata L.; see *T. wallichiana* Zucc.

T. wallichiana Zucc. syn. *T. baccata* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 240).

Aqueous extract of leaves showed antiimplantation activity (*Indian J. Med. Res.* 1969, 57, 237).

Chemical studies on taxine, isolated from leaves (*Itsuu Kenkyushu Nempo* 1958, 9, 16; *Chem. Abstr.* 1960, 54, 600 d; *J. Chem. Soc. C* 1966, 1933); a flavonoid, mp. 294°, isolated from leaves, similar in many respects to sciadopitysin (*Atti Accad. Naz. Lincei Rend. C1. Sci. Fis. Mat. Nat.* 1959, 26, 785; *Chem. Abstr.* 1960, 54, 8803 h); two new biflavones - isomers of sciadopitysin (I) and sotetsuflavone (II) mp. 212° and 300°, respectively - isolated from leaves; both compounds yielded same demethyl derivative (*Atti Accad. Naz. Lincei Rend. C1. Sci. Fis. Mat. Nat.* 1959, 27, 127; *Chem. Abstr.* 1960, 54, 14235 h; *Atti Accad. Naz. Lincei. Rend. C1. Sci. Fis. Mat. Nat.* 1960, 29, 74; *Chem. Abstr.* 1962, 57, 16537 b; *J. Am. Chem. Soc.* 1960, 82, 1505; *Atti Accad. Naz. Lincei. Rend. C1. Sci. Fis. Mat. Nat.* 1962, 32, 87; *Chem. Abstr.* 1963, 58, 4502 c); rhodoxanthin and eschscholtzxanthone from fruits (*Rev. Roum. Chim.* 1964, 9, 517; *Chem. Abstr.* 1965, 62, 14735 e); β -sitosterol, a methoxytriterpene (baccatine), mp. 219°, and a compound D, mp. 161°, from root bark; β -sitosterol also isolated from wood, bark and leaves (*Planta Med.* 1965, 13, 261; *Pharmazie* 1965, 20, 698; *Chem. Abstr.* 1966, 64, 6701).

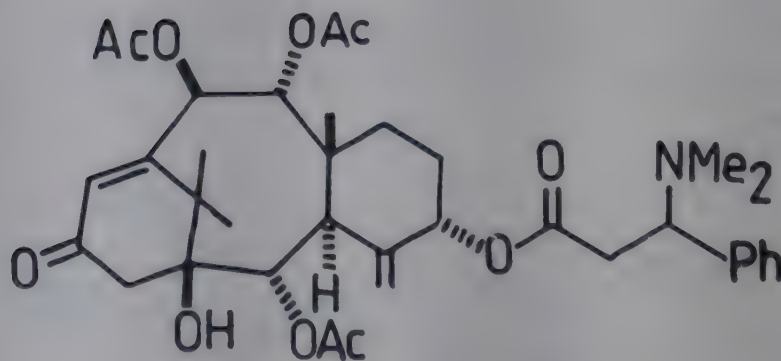
NEW COMPOUNDS

Eschscholtzxanthone

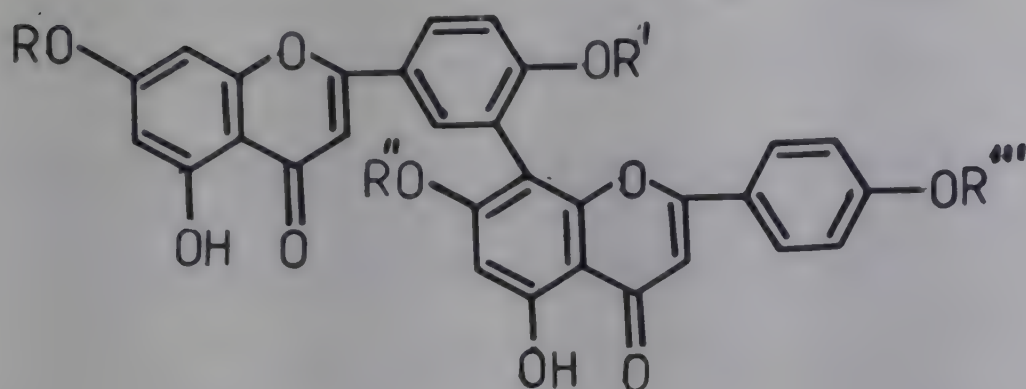
R = H, OH

Rhodoxanthin

R = O



Taxine



I

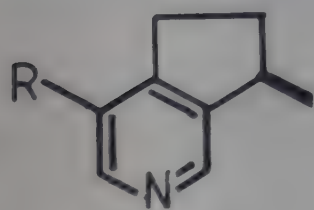
 $R, R', R''' = \text{Me}, R'' = \text{H}$

II

 $R, R''' = \text{H}, R', R'' = \text{H/Me}$ **TECOMA** (Bignoniaceae)

T. stans (L.) Juss. ex H. B. & K. syn. *Stenolobium stans* (L.) D. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 234).

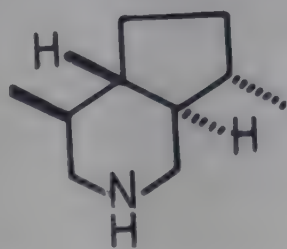
Isolation of tecomanine (tecomine), bp. $125^{\circ}/0.1 \text{ mm.}$, and tecostanine, mp. 85° , from leaves (*Tetrahedron Lett.* 1963, 397; *Ann. Pharm. Fr.* 1963, 21, 699; *Chem. Abstr.* 1964, 60, 8072 g; *Bull. Soc. Chim. Fr.* 1963, 2802); six alkaloids isolated; identity of four established as tecomanine, 4-noractinidine, N-normethylskytanthine and boschniakine (*Tetrahedron* 1969, 25, 1523); crystal structure of tecomanine (*Chem. Commun.* 1971, 994).

NEW COMPOUNDS

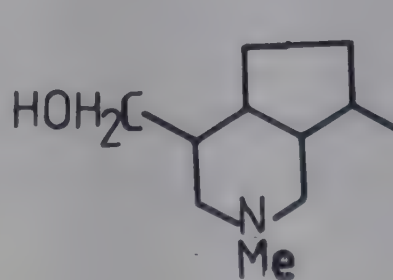
Boschniakine

 $R = \text{CHO}$

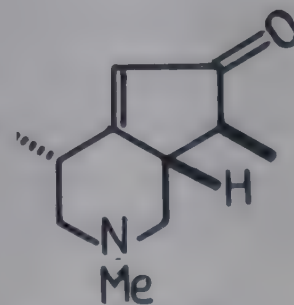
4-Noractinidine

 $R = \text{H}$ 

N-Normethylskytanthine



Tecostanine



Tecomanine

T. undulata (Roxb.) G. Don; see *Tecomella undulata* (Sm.) Seem.

TECOMELLA (Bignoniaceae)

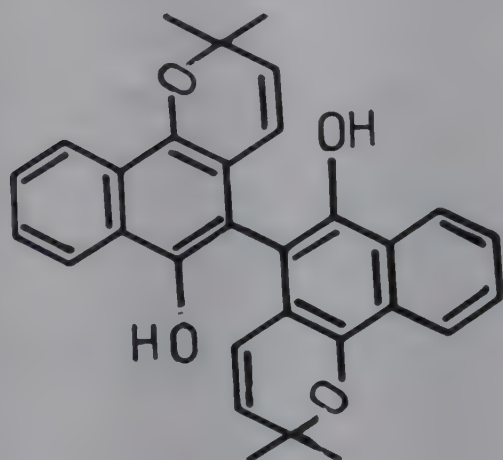
T. undulata (Sm.) Seem. syn. *Tecoma undulata* (Roxb.) G. Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 240).

Lapachol isolated from heartwood (*Indian J. Chem.* 1969, 7, 457).

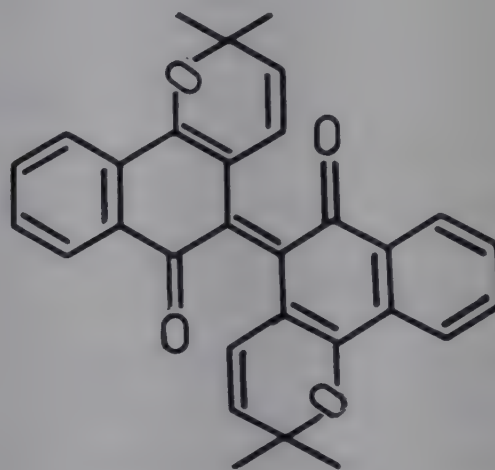
TECTONA (Verbenaceae)

T. grandis L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 240).

Anthraquinone-2-carboxylic acid, mp. 289° and anthraquinone-2-carboxaldehyde from heartwood (*Chem. Ind.* 1960, 1356); constitution and synthesis of tectol and dehydrotectol (*Chem. Ber.* 1964, 97, 588); tectoquinone from essential oil (*Curr. Sci.* 1965, 34, 48).

NEW COMPOUNDS

Tectol



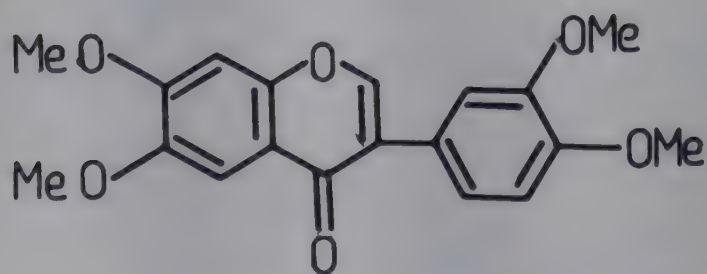
Dehydrotectol

TEPHROSIA (Papilionaceae)

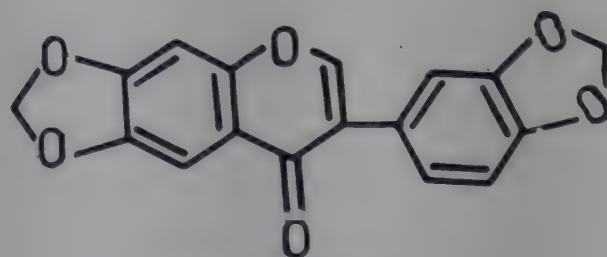
T. maxima (L.) Pers. syn. *T. purpurea* (L.) Pers. var. *maxima* Baker

Identity of maxima substance A with 3',4',6,7-tetramethoxyisoflavone from roots and its synthesis (*Proc. Indian Acad. Sci.* 1959, 50A, 219); revised structure of maxima isoflavone A and structure of maxima isoflavone B, isolated from roots, confirmed by synthesis (*Tetrahedron* 1962, 18, 1443; *Bull. Chem. Soc. Jpn.* 1962, 35, 1919).

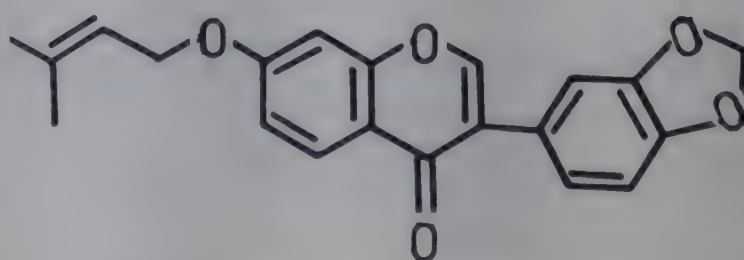
Distribution : Orissa, Andhra Pradesh, Karnataka and Kerala, especially along the coast.

NEW COMPOUNDS

Maxima substance A



Maxima isoflavone A



Maxima isoflavone B

T. purpurea (L.) Pers. var. *maxima* Baker; see *T. maxima* (L.) Pers.

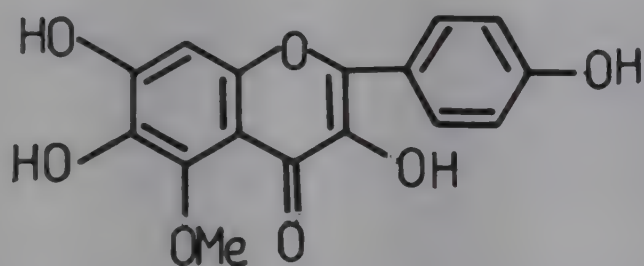
T. vogelii Hook.f.

Eng. - Fishpoison bean.

Vogelestin, mp. 283° , from seeds (*Proc. Indian Acad. Sci.* 1959, 49A, 241); isolation of a new anthoxanthin glycoside - vogeloside - composed of vogelestin, arabinose and rhamnose (*Planta Med.* 1962, 10, 173); synthesis of vogelestin (*Tetrahedron Lett.* 1965, 3849).

Distribution : Native of tropical Africa, introduced into India as cover crop in tea estates of Assam and peninsular India, where it has run wild; found upto 2000 m.

NEW COMPOUNDS



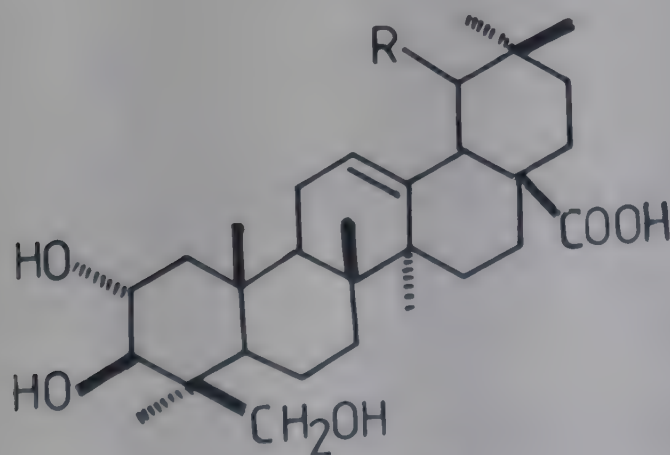
Vogelestin

TERMINALIA (Combretaceae)

T. alata Heyne ex Roth syn. *T. tomentosa* (DC.) W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 242).

β -Sitosterol, oleanolic acid, arjunolic acid (1.5%), mp. 332° and a new triterpene acid - tomentosic acid - isolated; latter characterised as $2\alpha,3\beta,11\beta,24$ -tetrahydroxyolean-12-en-28-oic acid (*Tetrahedron Lett.* 1960, 12; *Tetrahedron* 1962, 18, 827).

NEW COMPOUNDS



Arjunolic acid

R = H

Tomentosic acid

R = β -OH

T. arjuna (Roxb.) W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 241).

Arjunolic acid, tomentosic acid, β -sitosterol, ellagic acid, (+)leucodelphinidin and a saponin, mp. 216° , isolated along with an ester, mp. 87° ; saponin on hydrolysis yielded arjunolic acid and glucose; structure of arjunolic acid confirmed by synthesis (*J. Indian Chem. Soc.* 1962, 39, 89; *Sci. Res.* 1966, 3, 157; *Chem. Abstr.* 1967, 66, 83100 u; *Summer Sch. Org. Chem. Shillong, India* 1961, 181; *Chem. Abstr.* 1965, 63, 18178 e).

T. bellirica (Gaertn.) Roxb. (*belerica*) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 241).

Kernel oil had purgative action and its prolonged use was well tolerated in mice. The oil was bland but its hydrolysed product, like castor oil, was irritant (*Indian J. Med. Res.* 1969, 57, 103).

A new cardiac glycoside - bellericanin - isolated which yielded glucose and galactose (2:1) (*J. Indian Chem. Soc.* 1968, 45, 913).

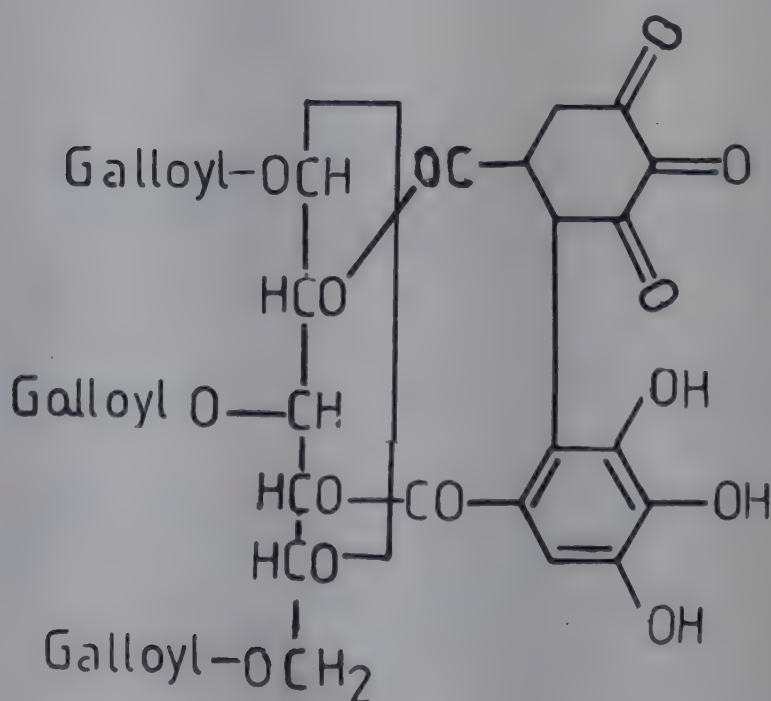
T. catappa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 241).

Gallic acid, ellagic acid, corilagin and unidentified flavonoids isolated from leaves, fruits and bark (*Leather Sci.* 1966, 13, 298; *Chem. Abstr.* 1967, 66, 83074 p); oil from fruits resembled almond oil (*Indian Oil Soap J.* 1968, 33, 271; *Chem. Abstr.* 1968, 69, 103789 t).

T. chebula (Gaertn.) Retz. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, 242).

Chebulin, mp. 249° , from flowers (*J. Sci. Ind. Res.* 1962, 21C, 345); a purgative glycoside of an anthraquinone derivative isolated (*Indian J. Pharm.* 1965, 27, 145); a tannin - terchebin - from fruits (*Ann. Chem.* 1967, 706, 169).

NEW COMPOUNDS



Terchebin

BIOLOGICAL ACTIVITY

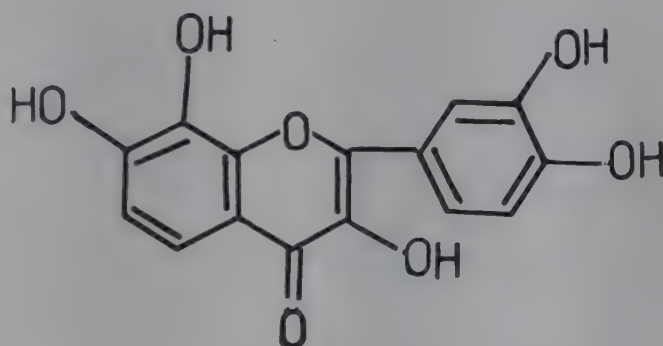
LD50 of chebulin was 550 mg/kg in mice. It exhibited antispasmodic action on smooth muscle similar to that of papaverine (*J. Sci. Ind. Res.* 1962, 21C, 345).

***T. manii* King**

Andamans - Kala chuglam.

Melanoxetin, mp. 295°, from heartwood (*J. Sci. Ind. Res.* 1962, 21B, 196).

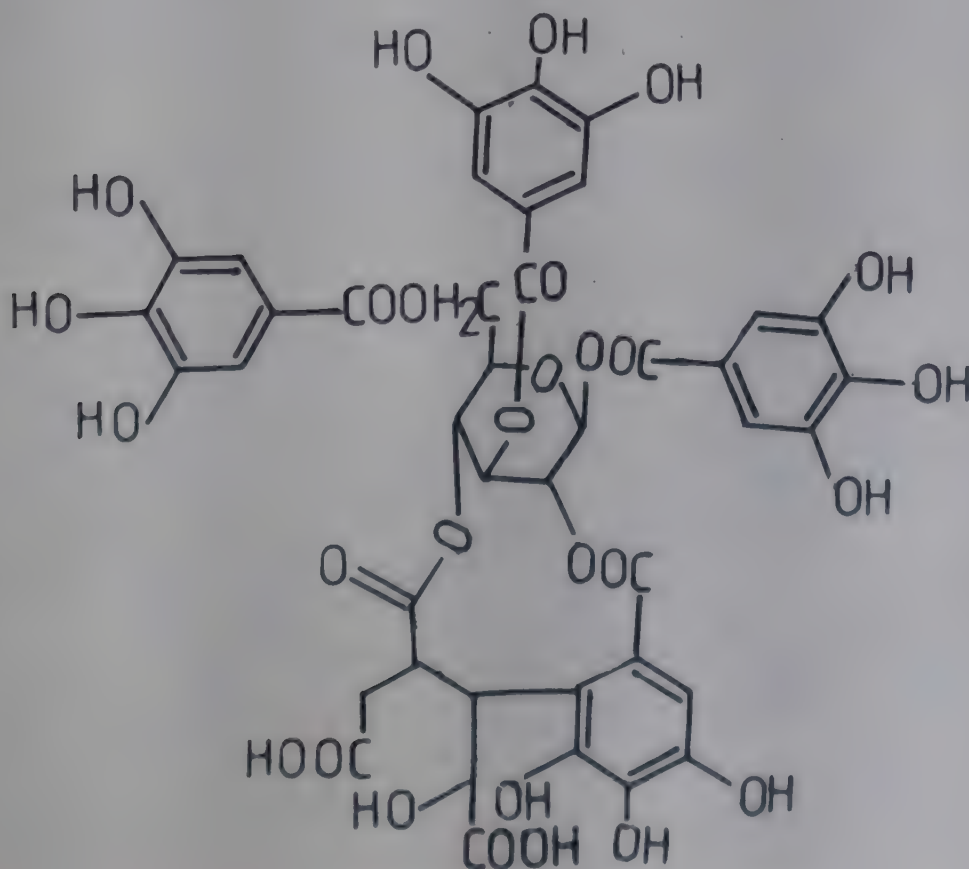
Distribution : Andaman Islands.

NEW COMPOUNDS

Melanoxetin

T. myriocarpa Heurck & Muell.-Arg. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 242).

Ellagic, gallic, chebulinic and chebulagic acids, from bark (*J. Proc. Inst. Chemists*, Calcutta 1967, 39, 111; *Chem. Abstr.* 1968, 68, 27514 m).

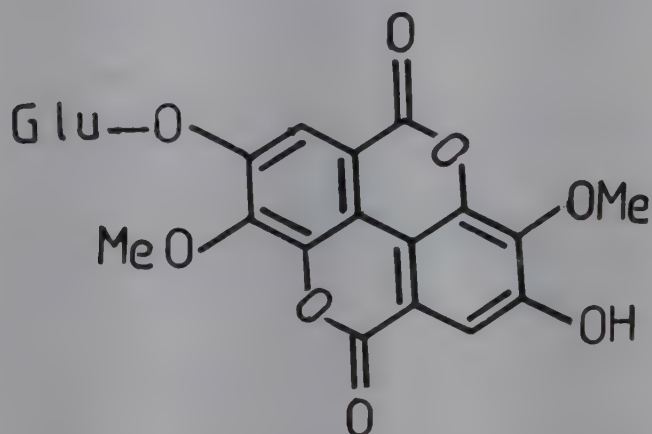
NEW COMPOUNDS

Chebulinic acid

T. paniculata Roth (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 242).

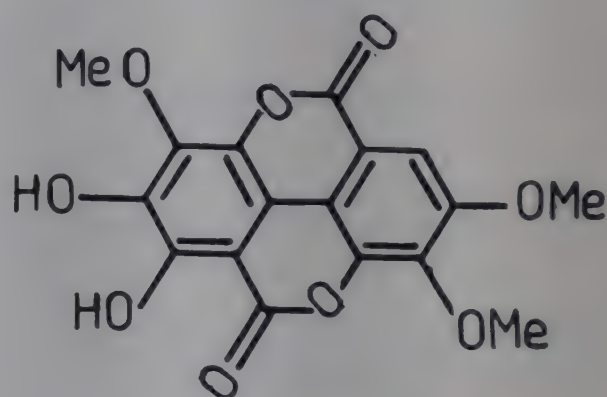
An unidentified triterpene carboxylic acid and 3,3'-di-O-methylellagic acid-4-glucoside, mp. 289°, isolated, in addition to β -sitosterol (*Tetrahedron* 1962, 18, 357); tetra-O-methylellagic acid, mp. 340°, and penta-O-methylflavellagic acid, mp. 240°, from heartwood (*Curr. Sci.* 1965, 34, 177); 3,3'-di-O-methylellagic acid and 3,3',4-tri-O-methylflavellagic acid, isolated from heartwood (*Tetrahedron* 1967, 23, 879).

NEW COMPOUNDS



3,3'-Di-O-methylellagic acid-4-glucoside

T. tomentosa (DC.) W. & A.; see *T. alata* Heyne ex Roth



3,3',4-Tri-O-methylflavellagic acid

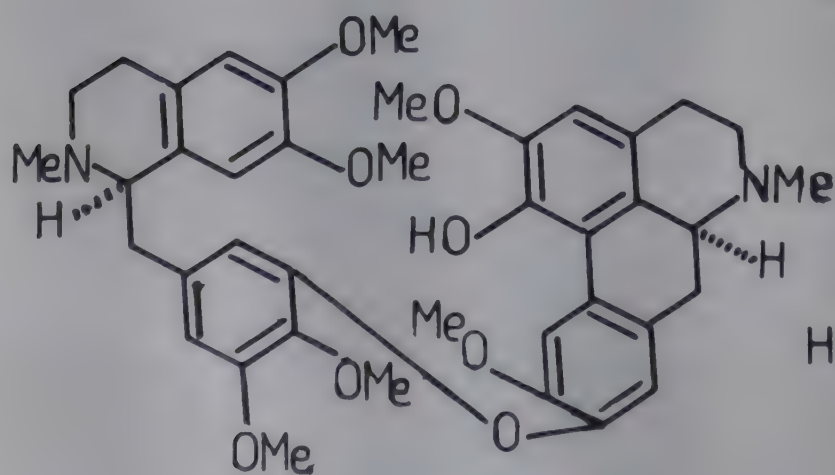
THALICTRUM (Ranunculaceae)

T. foetidum L. syn. *T. minus* L. var. *foetidum* (L.) Hook.f. & Thoms.

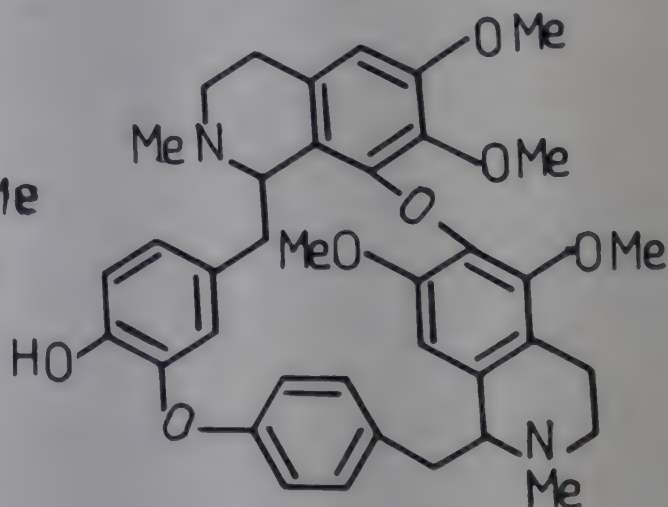
Phetidine isolated from aerial parts (*Khim. Prir. Soedin.* 1966, 2, 43; *Chem. Abstr.* 1966, 65, 2320 d); thalfoetidine, mp. 168°, isolated (*Chem. Ind.* 1966, 1178); thalphin, mp. 141° and thalphinin, mp. 117°, from roots (*Khim. Prir. Soedin.* 1968, 4, 330; *Chem. Abstr.* 1969, 70, 75086 m).

Distribution : North-west Himalayas from Himachal Pradesh to Kumaon, alt. 2500 - 4000 m.

NEW COMPOUNDS



Phetidine



Thalfoetidine

T. foliolosum DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 243).

Thalictrin, mp. 202°, isolated from rhizomes, identified as magnoflorine (*J. Sci. Ind. Res.* 1959, 18B, 444).

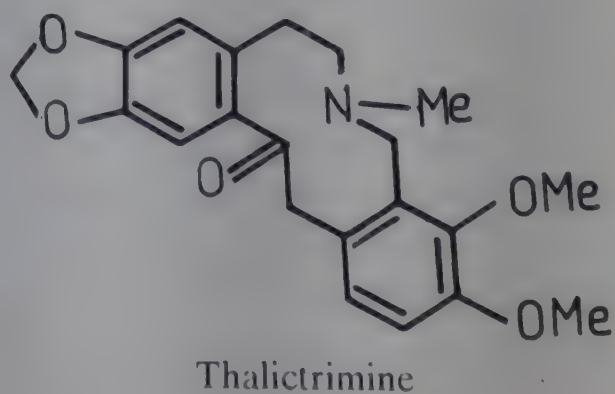
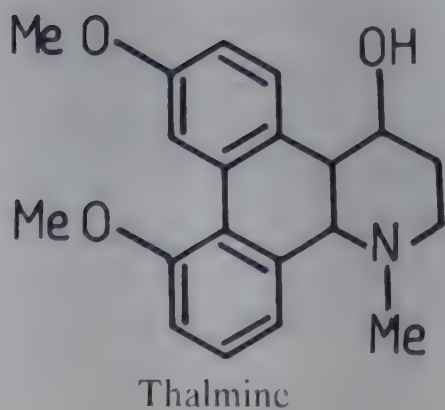
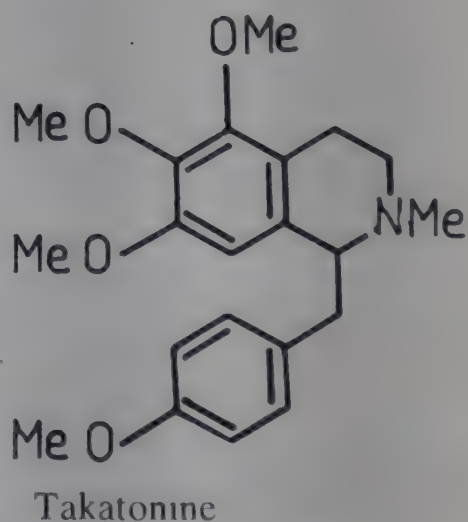
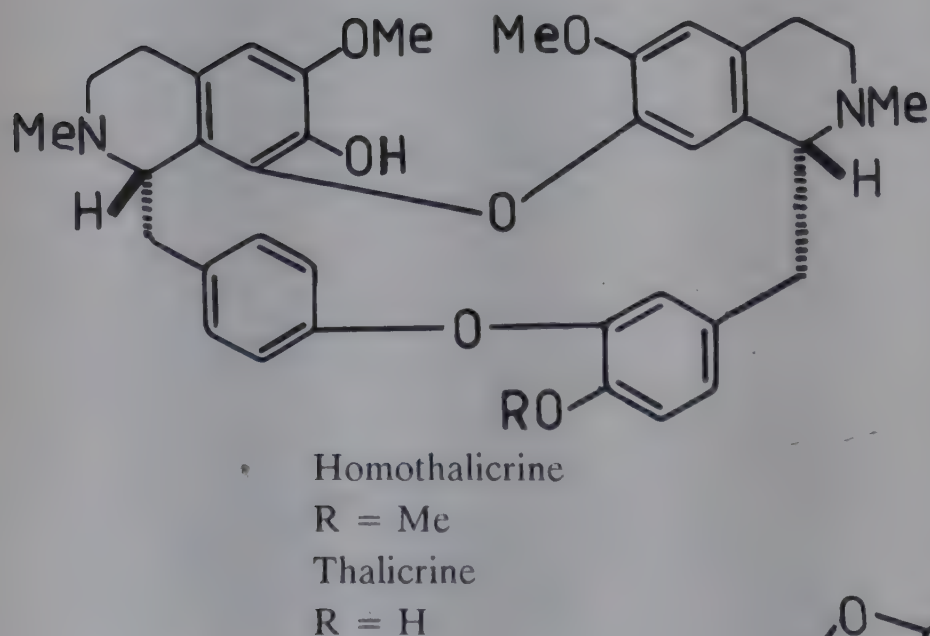
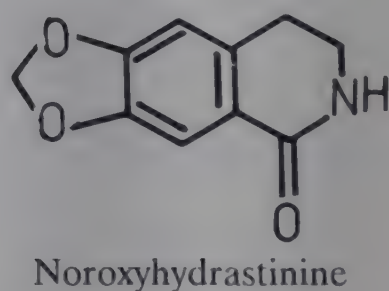
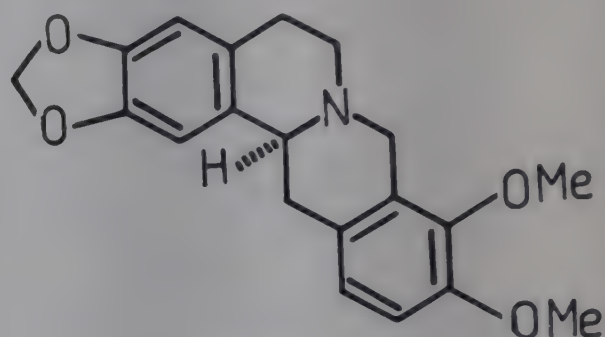
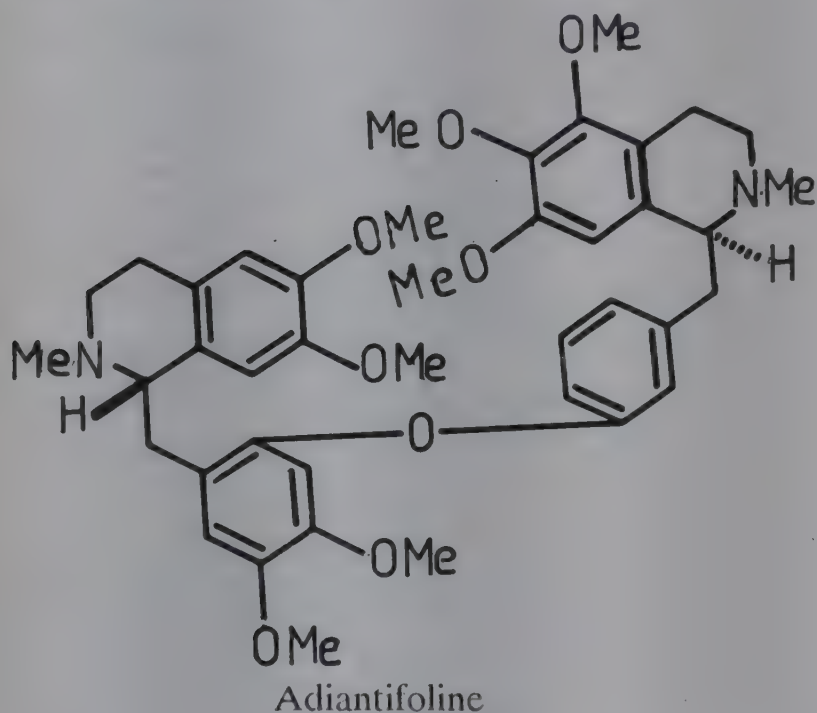
T. minus L. syn. *T. thunbergii* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 243).

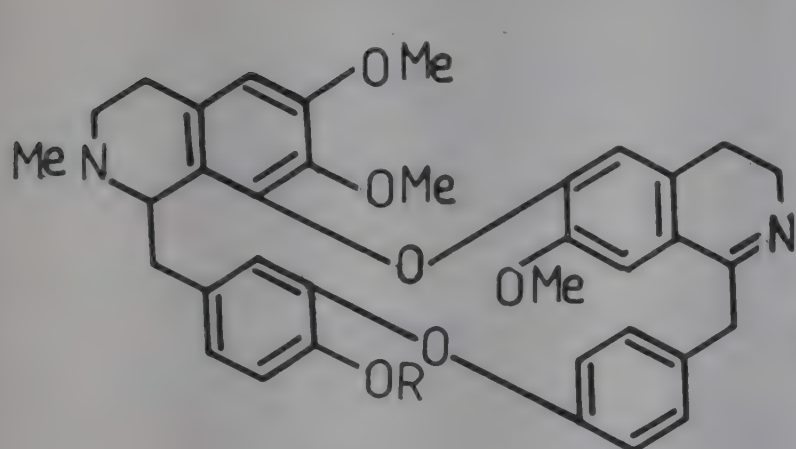
Administration of alkaloidal fraction to rats reduced histamine content of small intestine and lungs which reached its minimum (50%) on eleventh day; recovery occurred on tenth day after cessation of alkaloid administration (*Eksp. Med. Morfol.* 1967, 6, 135; *Abstr.* 1968, 68, 58433 p). Bisbenzylisoquinoline and aporphine alkaloids responsible for antitumor activity of plant (*Pharm. Weekbl.* 1969, 104, 501; *Chem. Abstr.* 1969, 71, 116500 h).

Detection of five alkaloids by PC in plant growing in Moldavian SSR; chief alkaloid - thalictrimine, mp. 169° - isolated and identified as β -allocryptopine (*Uchenye Zapiski Vologodsk. Gosudarst. Pedagog. Inst.* 1959, 24, 309; *Chem. Abstr.* 1961, 55, 27394 e; *Izv. Akad. Nauk Mold. SSR Ser. Biol. Khim.* 1962, 98; *Chem. Abstr.* 1965, 62, 9459 b; *Izv. Akad. Nauk. Mold. SSR Ser. Biol. Khim.* 1965, 43; *Chem. Abstr.* 1967, 66, 95252 h); isolation and structure of thalicberine from stems and leaves (*Yakugaku Zasshi* 1959, 79, 1386; *Chem. Abstr.* 1960, 54, 13163 i; *Yakugaku Zasshi* 1960, 80, 1137; *Chem. Abstr.* 1961, 55, 595 f; *Yakugaku Zasshi* 1963, 83, 153; *Chem. Abstr.* 1963, 59, 3971 b; *Lloydia* 1969, 32, 29); takatonine isolated from leaves as iodide, mp. 192° (*Yakugaku Zasshi* 1959, 79, 1082; *Chem. Abstr.* 1960, 54, 4643 a); thalictiin (0.1%), mp. 238°, isolated from leaves and characterised as apigenin-7-galactoside (*Yakugaku Zasshi* 1960, 80, 759; *Chem. Abstr.* 1960, 54, 21647 a); structure elucidation of thalmine (*Zh. Obshch. Khim.* 1960, 30, 1721; *Chem. Abstr.* 1961, 55, 3631 i); structure studies on thalmidine (*Dokl. Akad. Nauk. Uz. SSR* 1961, 21; *Chem. Abstr.* 1964, 61, 693 h); thalicine, mp. 221°, and homothalicine, mp. 235°, isolated from roots and found identical with aromoline and O-methylaromoline respectively (*Yakugaku Zasshi* 1962, 82, 311; *Chem. Abstr.* 1963, 58, 3468 c; *Bull. Inst. Chem. Res. Kyoto Univ.* 1964, 42, 235; *Chem. Abstr.* 1965, 62, 5310 a); two new alkaloids - O-methylthalmethine, mp. 245° and thalmethine, mp. 275° - isolated, along with berberine from aerial parts (*Chem. Ind.* 1965, 1569; *C.R. Acad. Bulg. Sci.* 1965, 18, 849; *Chem. Abstr.* 1966, 64, 3957 h; *Herba Hung.* 1966, 5, 67; *Chem. Abstr.* 1968, 68, 57371 e); isolation of thalicarpine along with thalmelatine (*Tetrahedron Lett.* 1965, 4309; *Herba Hung.* 1966, 5, 67; *Chem. Abstr.* 1968, 68, 57371 e); review of alkaloids (*Tokushima Daigaku Yakugaku Kenkyu Nempo* 1965, 14, 24; *Chem. Abstr.* 1967, 67, 88265 g); isolation and structure of new aporphine alkaloid - dehydrothalicarpine, mp. 180° (*Chem. Ind.* 1966, 770); thalicmine, thalicmidine and thalicminine, mp. 263°, from roots; structure determination of thalicmidine (*Khim. Prir. Soedin.* 1966, 2, 426; *Chem. Abstr.* 1968, 68, 13226 g; *Khim. Prir. Soedin.* 1967, 3, 67; *Chem. Abstr.* 1967, 67, 11627 u); allocryptopine and l-canadine- β -methochloride, mp. 191°, from alkaloidal extractive of aerial parts (*Khim. Prir. Soedin.* 1967, 3, 141; *Chem. Abstr.* 1967, 67, 54327 p); two new isoquinolone alkaloids - noroxyhydrastinine and thalifoline - isolated from roots and characterised as 6,7-methylenedioxy-1-oxo-1, 2,3,4-tetrahydroisoquinoline

and 2-methyl-6-methoxy-7-hydroxy-1-oxo-1,2,3,4-tetrahydroisoquinoline respectively (*Tetrahedron* 1969, 25, 469; *Lloydia* 1969, 32, 29); adiantifoline along with other alkaloids from roots (*Lloydia* 1969, 32, 29); thalactamine, mp. 112° , isolated from aerial parts of Bulgarian plant and characterised as 1-oxo-2-methyl-5,6,7-trimethoxy-1,2-dihydroisoquinoline (*Tetrahedron Lett.* 1969, 1951).

NEW COMPOUNDS



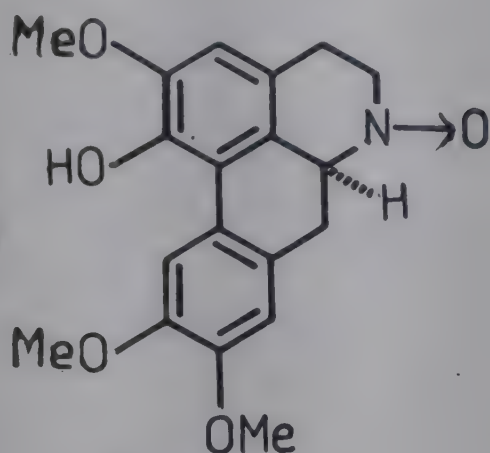


Thalmethine

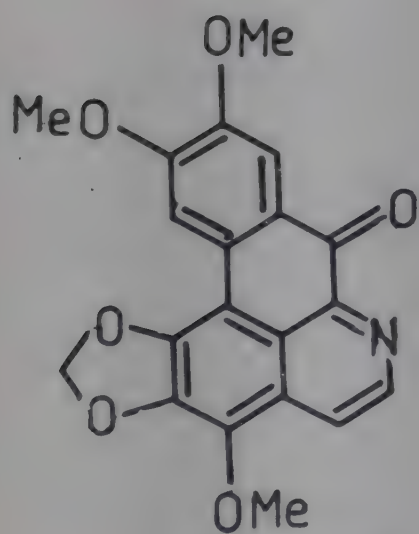
R = H

O-Methylthalmethine

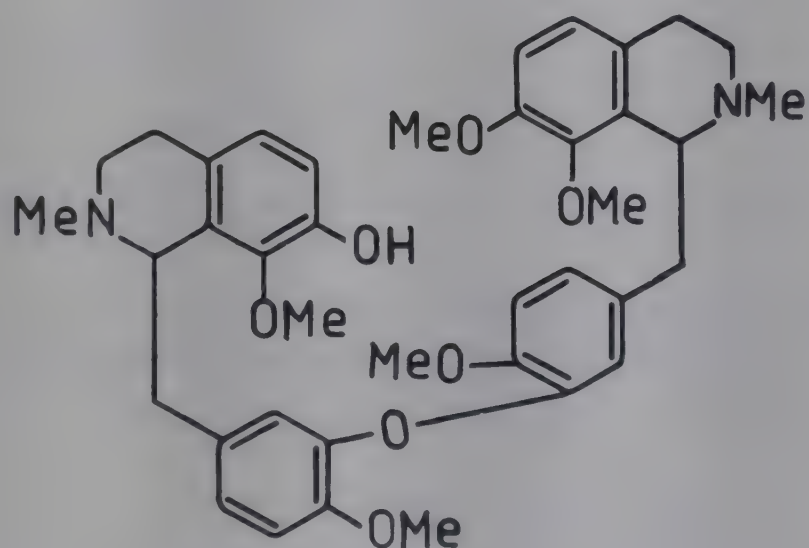
R = Me



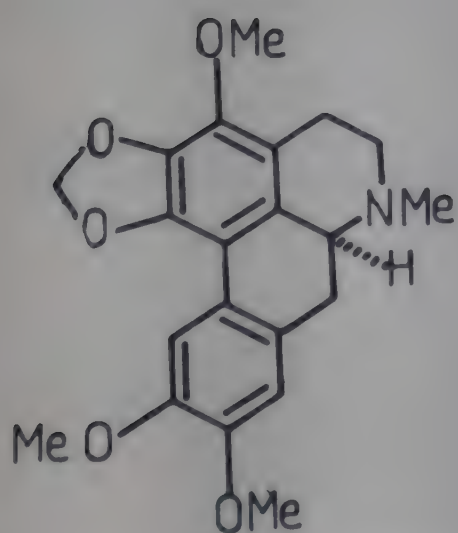
Thalictmidine



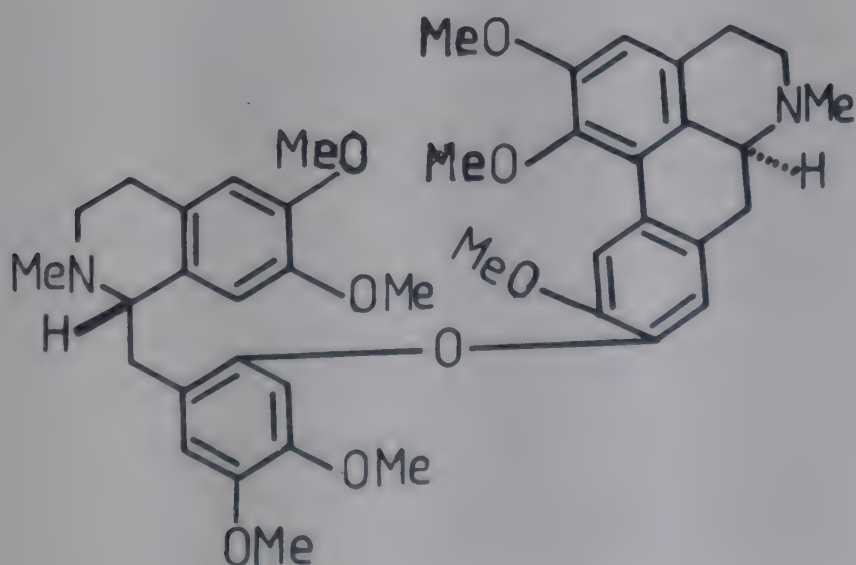
Thalictminine



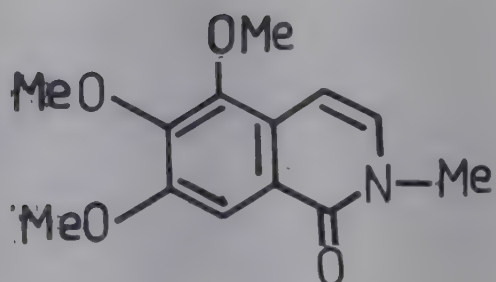
Thalmelatine



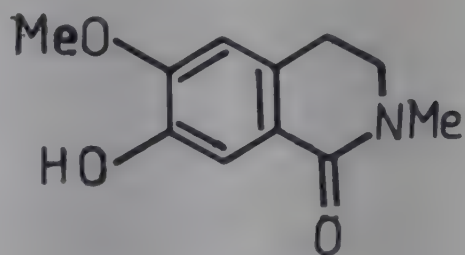
Thalictmine



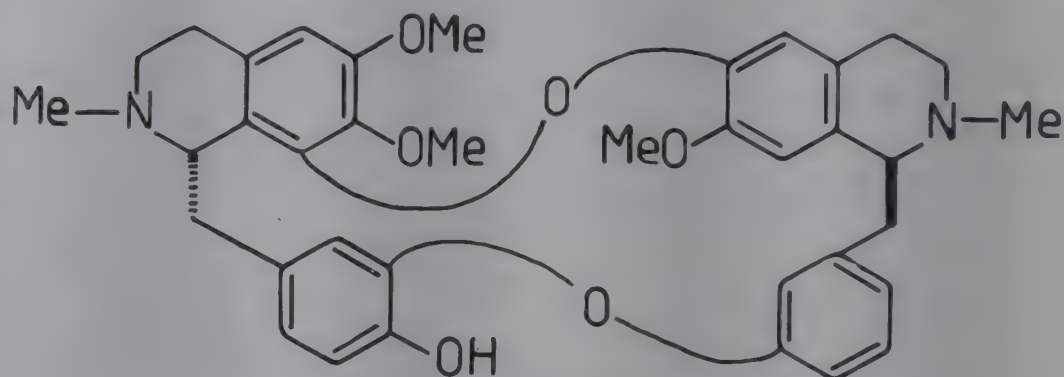
Thalictarpine



Thalactamine



Thalifoline



Thalicterine

T. minus L. var. *foetidum* (L.) Hook.f. & Thoms.; see *T. foetidum* L.

T. pedunculatum Edgew.

Berberine from roots (*Indian J. Pharm.* 1964, 26, 69).

Distribution : Western Himalayas, Simla westward, alt. 1800-2500 m.

T. thunbergii DC.; see *T. minus* L.

THAMNOLIA (Siphulaceae)

T. subvermicularis Asahina

Thamnolic acid (4.0) and D-arabitol (1.6%) isolated (*J. Sci. Ind. Res.* 1961, 20B, 166).

Distribution : Nepal.

T. vermicularis (Sw.) Ach.

Thamnolic acid (7.8) and D-arabitol (2.0%) isolated (*J. Sci. Ind. Res.* 1961, 20B, 166).

Distribution : Alpine regions of Himalayas.

THEA (Theaceae)

T. sinensis L.; see *Camellia sinensis* (L.) Kuntze

THELEPOGON (Poaceae)

T. elegans Roth ex R. & S.

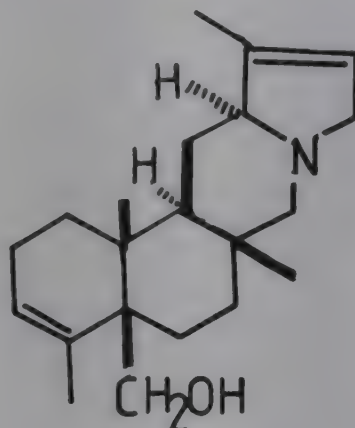
Bo. - Kadi, Tirpha.

A diterpenoid alkaloid - thelepogine, mp. 184° - isolated from plant; its structure and absolute configuration determined by X-ray diffraction studies (*Tetrahedron Lett.* 1960; 18;

Chem. Abstr. 1961, 55, 10488 g; *Aust. J. Chem.* 1962, 15, 159); thelepogidine, mp. 254° and thelepogine isolated from grass (*Aust. J. Chem.* 1962, 15, 159).

Distribution : Tropical India from Madhya Pradesh southwards to Kerala.

NEW COMPOUNDS



Thelepogine

THESPESIA (Malvaceae)

T. populnea (L.) Soland. ex Correa (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 243).

A flavonoid - thespesin, mp. 190° - isolated from fruits (*Indian J. Chem.* 1963, 1, 451); (+)gossypol, mp. 181°, from flowers, fruits and bark (*Curr. Sci.* 1968, 37, 135; *Tetrahedron Lett.* 1968, 261).

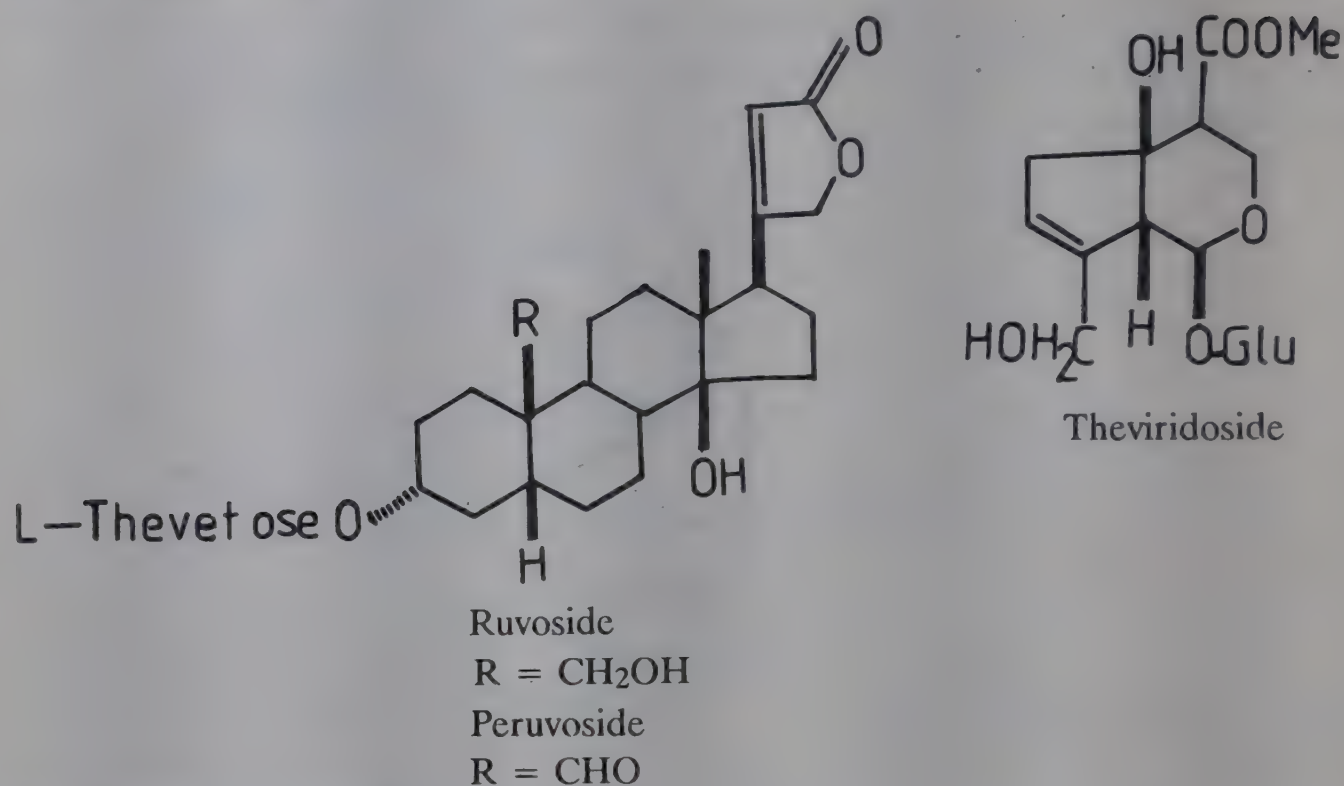
THEVETIA (Apocynaceae)

T. neriifolia Juss. ex Steud.; see *T. peruviana* (Pers.) K. Schum.

T. peruviana (Pers.) K. Schum. syn. *T. neriifolia* Juss. ex Steud. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 243).

A mixture of sterols isolated as acetates from seed kernels (*Cienc. Nat.* 1959, 11, 92; *Chem. Abstr.* 1960, 54, 13548 d); chemical interrelationship of peruvoside, mp. 164°, and ruvoside, isolated from seeds; ruvoside characterised as α -L-thevetoside of cannogenol (*J. Sci. Ind. Res.* 1959, 18B, 443 g; *Indian* 66,196 (1960) Dec. 19; *Chem. Abstr.* 1961, 55, 14832 g; *Proc. Indian Acad. Sci.* 1961, 54A, 345; Yao Hsueh Hsueh Pao 1964, 11, 464; *Chem. Abstr.* 1965, 62, 9465 a); physical and chemical characteristics of twenty four monoglycosides tabulated; theveneriin and ruvoside identical while thevefolin and neriifolin are different (*Helv. Chim. Acta* 1962, 45, 938); cerebrin, mp. 215° and perusitin, mp. 168°, isolated from seeds (Yao Hsueh Hsueh Pao, 1964, 11, 464; *Chem. Abstr.* 1965, 62, 9465 d); a new iridoid glucoside viridoside - isolated from stem bark and structure established (*Helv. Chim. Acta* 1969, 52, 478).

NEW COMPOUNDS



BIOLOGICAL ACTIVITY

Peruvoside showed positive inotropic effect followed by cardiac arrest in isolated frog or guinea pig heart; comparative data of ouabain and digoxin given. It produced emesis in cats and pigeons and showed musculotropic activity on smooth muscles. Approximate LD values of peruvoside were 147 γ /kg in cats, 710 γ /kg in guinea pigs and 203 γ /kg in pigeons (*Arch. Int. Pharmacodyn. Ther.* 1960, 126, 412; *Chem. Abstr.* 1961, 55, 5777 f). Perfusion of thevetin, peruvoside or ruvoside produced positive inotropic effect on hypodynamic myocardium in anaesthetised cats and electrocardiographic changes typical of cardenolides (*Proc. Int. Pharmacol. Meeting 1st, Stockholm* 1961, 277; *Chem. Abstr.* 1964, 61, 7535 d); peruvoside exhibited marked cardiotoxic effect in isolated denervated heart-lung preparation of dog. It was as potent as ouabain and appeared a promising drug for congestive heart failure (*Indian J. Exp. Biol.* 1967, 5, 31).

THUJA (Cupressaceae)

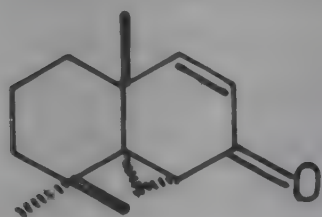
T. occidentalis L.

Eng. - American arbor-vitae, White cedar; H. - Thuja, Morpankhi.

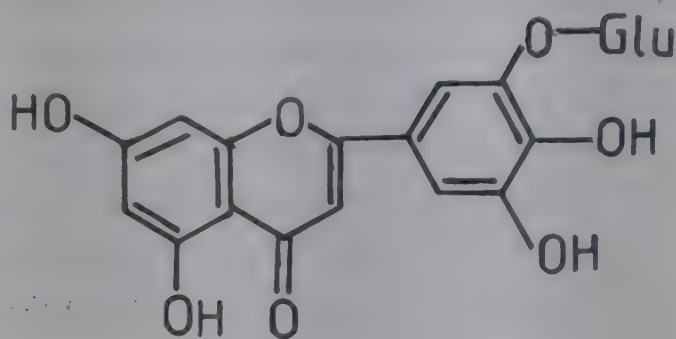
Mayurone, mp. 69°, from essential oil (*Tetrahedron Lett.* 1965, 3773); 3',4',5,5',7-pentahydroxyflavone-3'-glucoside (I) isolated from leaves and characterised (*Tetrahedron Lett.* 1968, 1419).

Distribution : Introduced into Indian gardens from North America.

NEW COMPOUNDS



Mayurone



I

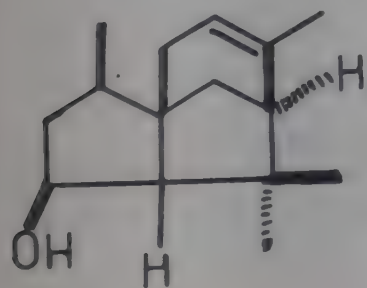
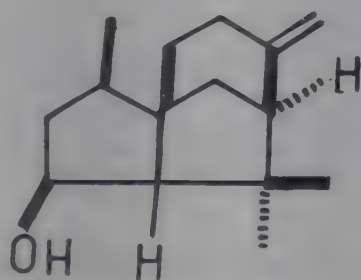
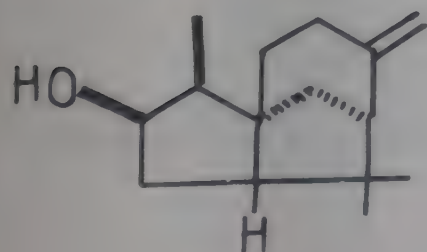
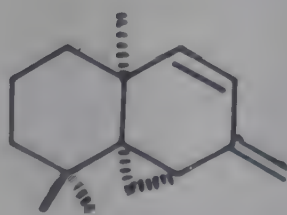
T. orientalis L. syn. *Biota orientalis* Endl.

Eng. - Oriental arbor-vitae; H. - Thuja, Morpankhi.

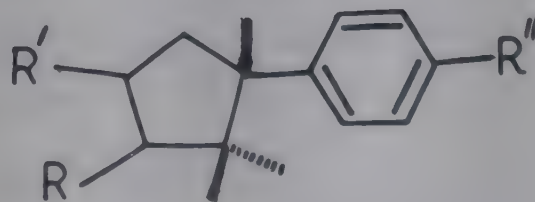
Palmitic (5.28), stearic (7.30), C-18 acids (36.29), C-20 acids (6.10) and linoleic acid (44.6%) from seed oil (*Pakistan J. Sci. Ind. Res.* 1963, 6, 260; *Chem. Abstr.* 1965, 63, 18491 h); presence of four cuparene-type alcohols- α , β , γ -cuparenols and α -isocuparenol - and two cedrane-type alcohols - α -biotol and β -biotol, mp. 84° - confirmed in wood essential oil (*Tetrahedron Lett.* 1968, 843); β -isobiotol, mp. 76° , thujopsadiene and curcumene ether from wood; structure of the latter proposed (*Mokuzai Gakkaishi* 1969, 15, 47; *Chem. Abstr.* 1969, 71, 50249 z).

Distribution : Native of China; grown in Indian gardens.

NEW COMPOUNDS

 α -Biotol β -Biotol β -Isobiotol

Thujopsadiene

 α -Cuparenol

$R = \beta\text{-OH}$, $R' = \text{H}$, $R'' = \text{Me}$

 β -Cuparenol

$R = \text{H}$, $R' = \alpha\text{-OH}$, $R'' = \text{Me}$

 γ -Cuparenol

$R, R' = \text{H}$, $R'' = \text{CH}_2\text{OH}$

THYMUS (Lamiaceae)

T. vulgaris L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 244).

Extractive of stems and leaves possessed maximum antibacterial activity against *Staphylococcus aureus* and *Escherichia coli* at flowering time (Ziva 1958, 6, 164; *Chem. Abstr.* 1960, 54, 2657 f).

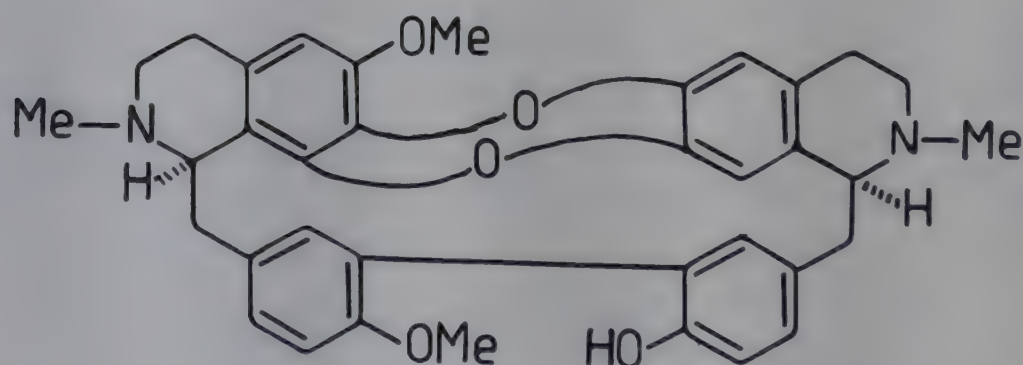
Maximum amount of volatile oil containing thymol, p-cymene, borneol and carvacrol, obtained from stems and leaves at flowering time (Ziva 1958, 6, 164; *Chem. Abstr.* 1960, 54, 2657 f); a new method for isolation of thymol from mixture of phenols contained in plant (*Aptech. Delo* 1959, 8, 39; *Chem. Abstr.* 1960, 54, 6035 a); two flavonoids - luteolin-7- β -glucoside and luteolin-diglucoside - separated by PC (*Naturwiss.* 1959, 46, 558; *Chem. Abstr.* 1960, 54, 16552 g); caffeic, ursolic and oleanolic acids detected by PC (*Pharm. Zentralhalle* 1959, 98, 356, 433; *Chem. Abstr.* 1960, 54, 819 f); trans-4-thujanol and 4-terpineol isolated (*C.R. Acad. Sci. Paris, Ser. D* 1968, 267, 1886; *Chem. Abstr.* 1969, 70, 54818 i).

TILIACORA (Menispermaceae)

T. acuminata (Lamk.) Miers syn. *T. racemosa* Colebr. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 244).

New bisbenzylisoquinoline alkaloids - tiliarine and tiliacorine - isolated from roots and chemically studied; tiliarine was stereoisomer of nor-tiliacorine (*J. Sci. Ind. Res.* 1959, 18B, 247; *J. Org. Chem.* 1960, 25, 981; *Tetrahedron* 1969, 25, 3091); six alkaloids detected by TLC in roots; bases A iodide, mp. 211°, B iodide, mp. 156° and D perchlorate, mp. 256°, separated (*Curr. Sci.* 1967, 36, 43); tiliacine, corine, mohinine and a new base - mosine, mp. 265° - isolated (*Phytochemistry* 1969, 8, 1559); tiliacorinine and nortiliacorinines A and B isolated (*Tetrahedron* 1969, 25, 3091); configuration of tiliacorine (*Chem. Commun.* 1978, 226).

NEW COMPOUNDS



Tiliacorine

BIOLOGICAL ACTIVITY

Corine showed curare-like activity; it produced hypertension as well as inhibition of myoneural transmission (*Phytochemistry* 1969, 8, 1559).

T. racemosa Colebr.; see *T. acuminata* (Lamk.) Miers

TINOSPORA (Menispermaceae)

T. cordifolia (Willd.) Miers ex Hook.f. & Thoms. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 244).

Plant extract caused reduction in fasting blood sugar in rabbits and rats, although hypoglycaemic effect in dose range 100-200 mg/kg was not proportional to the dose. Glucose tolerance in rats was increased by daily administration of plant extract. Bitter fraction of extract caused insignificant reduction in blood sugar level, but significantly inhibited

epinephrine-induced hyperglycaemia (*Indian J. Med. Res.* 1967, 55, 733).

An unidentified compound, mp. 114°, an amorphous compound, mp. 90°, a physiologically active unidentified compound, mp. 115°, a sterol, mp. 134° and a fatty acid, mp. 84°, isolated from plant (*J. Proc. Inst. Chemists*, Calcutta 1959, 31, 12; *Chem. Abstr.* 1960, 54, 4637 a); a diterpenoid of columbin type - tinosporin (0.02%), mp. 184° - isolated from plant (*Sci. Cult.* 1960, 26, 140, *Sci. Res.* 1964, 1, 177; *Chem. Abstr.* 1964, 61, 12331 b); tinosporide, mp. 236° and cordifolide, mp. 176°, isolated (*Sci. Res.* 1964, 1, 177; *Chem. Abstr.* 1964, 61, 12331 b).

T. crista (L.) Hook.f. & Thoms. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 245).

Sodium, potassium, calcium, iron, aluminium, copper and zinc estimated in leaves; two unidentified alkaloids, one hydroxy compound, mp. 95°, γ -sitosterol and another sterol and essential oil, bp. 116°, isolated from leaves (*Proc. Nat. Acad. Sci. India* 1959, 28A, 291; *Chem. Abstr.* 1961, 55, 697 a).

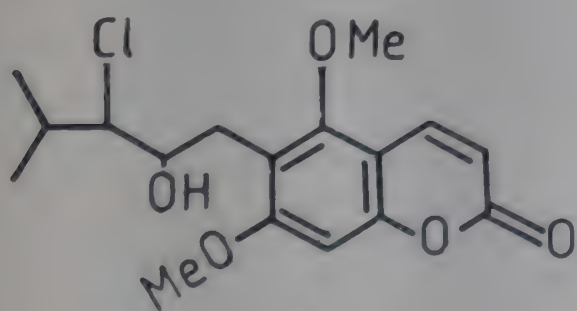
TODDALIA (Rutaceae)

T. aculeata Pers; see *T. asiatica* (L.) Lam.

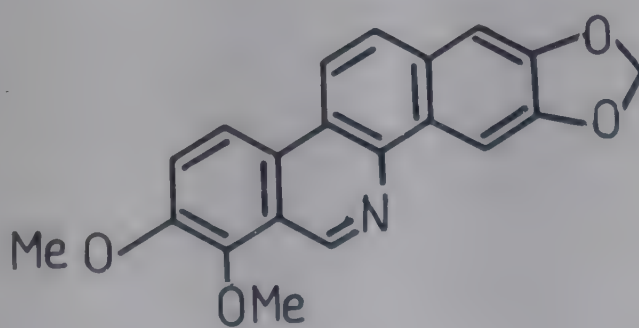
T. asiatica (L.) Lam. syn. *T. aculeata* Pers. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 245).

Toddalinine, mp. 165°, pimpinellin, mp. 118°, isopimpinellin, mp. 150° and 6-(3-chloro-2-hydroxy-3-methylbutyl)-5,7-dimethoxycoumarin (I), mp. 153°, isolated (*Indian J. Chem.* 1967, 5, 41); skimmianine, mp. 178°, 7,8-dimethoxy-2,3-methylenedioxybenzo[c]phenanthridine (II), mp. 220°, chelerythrine and dihydrochelerythrine from root bark (*Indian J. Chem.* 1967, 5, 280).

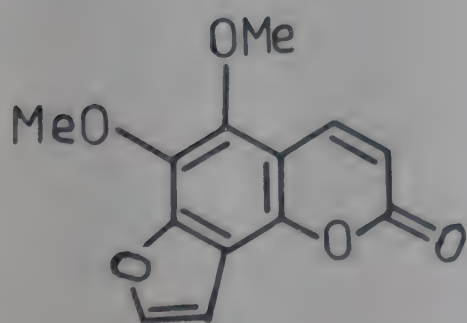
NEW COMPOUNDS



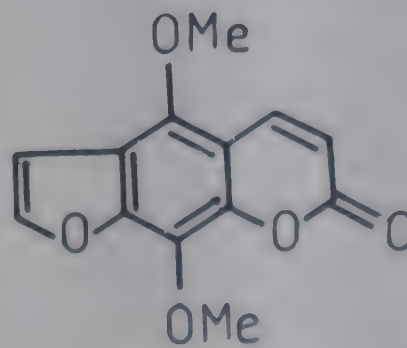
I



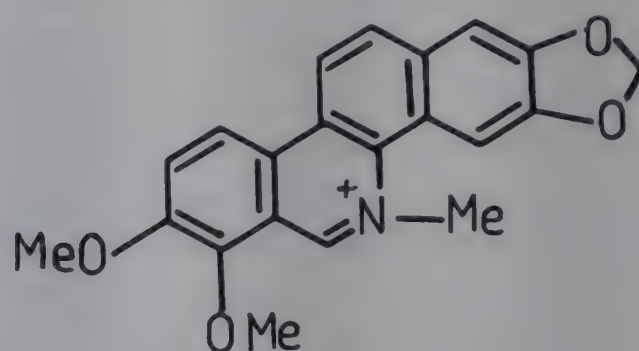
II



Pimpinellin



Isopimpinellin



Toddalinine

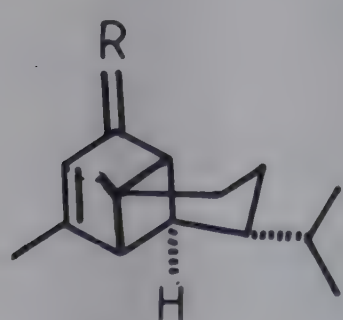
T. bilocularis W. & A.; see *Vepris bilocularis* (W. & A.) Engler

TOONA (Meliaceae)

T. ciliata M. Roem. syn. *Cedrela toona* Roxb. ex Rottl. & Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 56).

Isolation and structure of cedrelone, mp. 209°, from heartwood (*J. Sci. Ind. Res.* 1962, 21B, 95, *J. Chem. Soc.* 1963, 2515); extractives of wood and essential oil contain at least 14 components comprising essentially hydrocarbons (75%) [(-)-copaene, farnesene, (-)-allo-aromadendrene, (+)δ-cadinene, (-)-calamenene, (+)α-calacorene and cadalene etc.] and alcohols (25%) [(-)-δ-cadinol, (-)-ledol, T-muuirolol, cadinol, epicubenol and cubenol] (*Tetrahedron* 1965, 21, 607, 619; *Acta Chem. Scand.* 1966, 20, 2893; *Tetrahedron Lett.* 1967, 189); copaene and mustakone from essential oil (*Tetrahedron* 1965, 21, 607); geranylgeraniol, bp. 145°/0.35 mm., from trunk wood (*Tetrahedron Lett.* 1967, 189); structures assigned to T-muuirolol, (-)-δ-cadinol, cubenol and (+)δ-cadinene (*Tetrahedron Lett.* 1968, 1913).

NEW COMPOUNDS

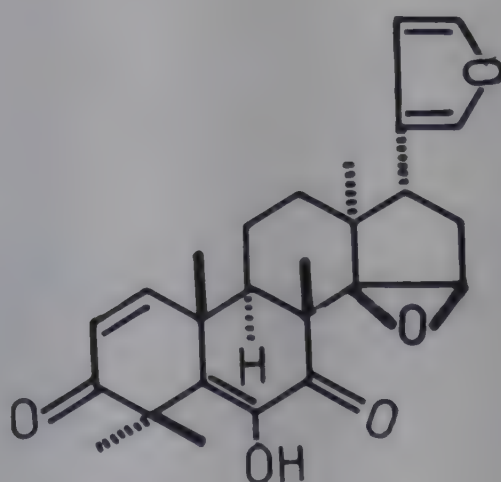


Copaene

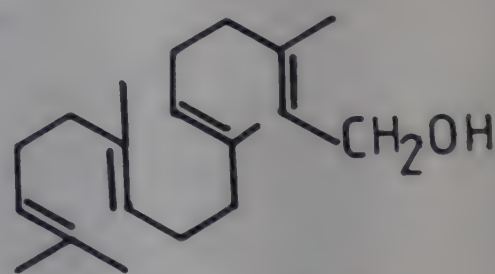
R = H,H

Mustakone

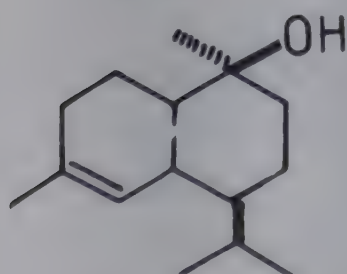
R = O



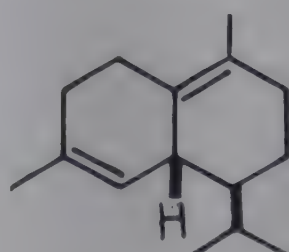
Cedrelone



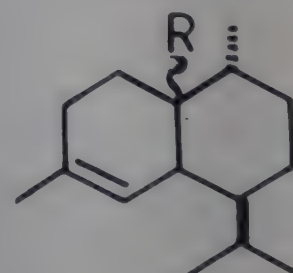
Geranylgeraniol



T-muuirolol



δ-Cadinene

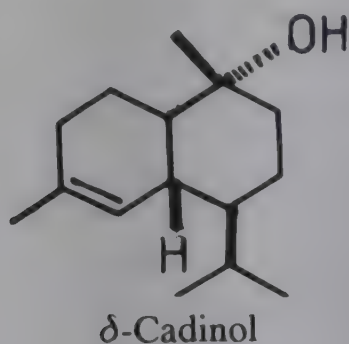


Cubenol

R = α-OH

Epicubenol

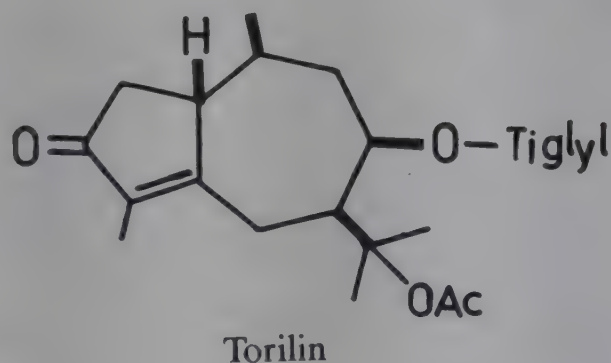
R = β-OH

**TORILIS** (Apiaceae)

T. japonica (Houtt.) DC. syn. *Caucalis anthriscus* (L.) Clarke (non Scop.)

Structure of torilin, isolated from seeds, established as a sesquiterpene ester of guaiane series (*Tetrahedron* 1969, 25, 4751).

Distribution : Himalayas from Kashmir to Sikkim, alt. 1000-3000 m.

NEW COMPOUNDS**TRACHYSPERMUM** (Apiaceae)

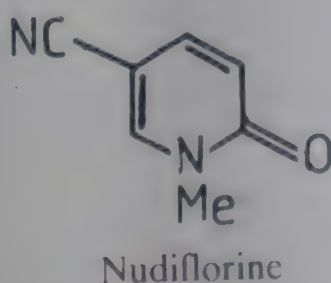
T. ammi (L.) Sprague syn. *Carum copticum* Benth. & Hook. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 245).

The glycosidal fraction, essential oil and total oil produced contraction of isolated ileum, tracheal chain and bronchial musculature. Essential oil and total oil caused marked fall in blood pressure in cat and had low toxicity (*Indian J. Med. Res.* 1962, 55, 1003).

TREWIA (Euphorbiaceae)

T. nudiflora L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 246).

Taraxerone (0.002), mp. 240°, β -sitosterol (0.02%), from bark (*Indian J. Chem.* 1964, 2, 171); nudiflorine characterised as 1-methyl-5-cyano-2-pyridone (*Tetrahedron* 1966, 22, 1461).

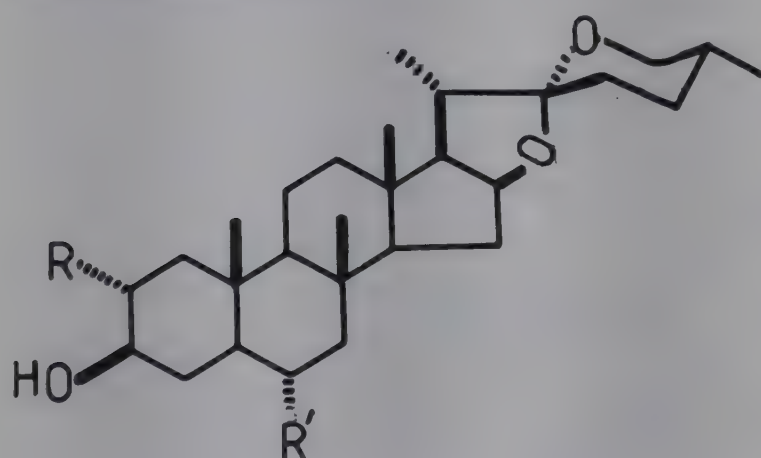
NEW COMPOUNDS

TRIBULUS (Zygophyllaceae)

T. terrestris L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 247).

Seed extract showed diuretic effect in rats which could be attributed to presence of potassium salts in high concentration (*Indian J. Med. Res.* 1967, 55, 714).

Diosgenin, gitogenin, mp. 267° and chlorogenin, mp. 275°, isolated (*Stud. Cercet. Biochem.* 1968, 11, 269; *Chem. Abstr.* 1969, 70, 35069 b); kaempferol, its 3-glucoside, its 3-rutinoside and tribuloside isolated from fruits and leaves; tribuloside characterised as kaempferol-3 β -D-(6''-p-coumaroyl) glucoside (*Phytochemistry* 1969, 8, 299).

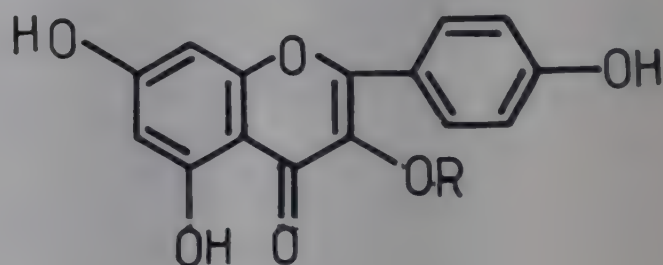
NEW COMPOUNDS

Chlorogenin

R = H, R' = OH

Gitogenin

R = OH, R' = H



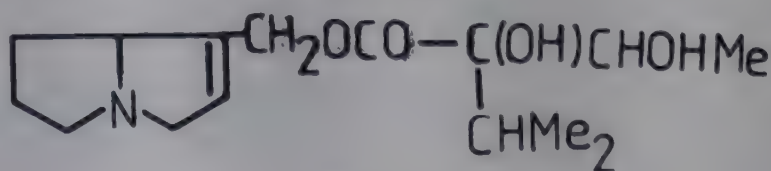
Tribuloside

R = Glu(6''-p-coumaroyl)

TRICHODESMA (Boraginaceae)

T. zeylanicum (Burm.f.) R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 247).

Alkaloid - supinine (1.0%), mp. 147° - isolated from seeds (*J. Chem. Soc.* 1961, 484).

NEW COMPOUNDS

Supinine

TRICHOLEPSIS (Asteraceae)

T. procumbens Wt.; see *Oligochaeta racemosa* (Roxb.) Wagenitz

TRIFOLIUM (Papilionaceae)

T. fragiferum L.

Eng. - Strawberry clover; Kash. - Chit-batt.

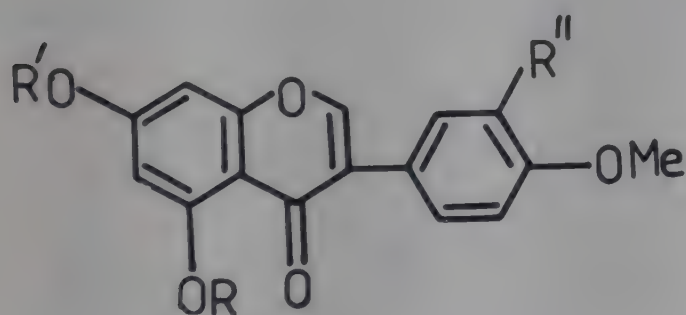
Soyasapogenol B, mp. 260°, soyasapogenol C, mp. 240°, an unidentified sapogenin, mp, 227°, and several sugars obtained by acid hydrolysis of mixture of saponins isolated from plant (*J. Am. Pharm. Assoc. Sci. Ed.* 1960, 49, 735; *Chem. Abstr.* 1961, 55, 4887 b).

Distribution : Kashmir and Sirsa (Haryana).

T. pratense L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 248).

Structure of trifolirhizin, mp. 142°, elucidated (*Acta Chem. Scand.* 1961, 15, 696); absolute configuration of trifolirhizin (*Chem. Commun.* 1965, 595); pratensein characterised as 3',5,7-trihydroxy-4'-methoxyisoflavone by synthesis (*Tetrahedron Lett.* 1963, 159); monetin-7-glucoside and biochanin A-7-glucoside isolated from leaves (*Naturwiss.* 1965, 52, 517; *Chem. Abstr.* 1965, 63, 16774 h); an isoflavone glucoside (I), mp. 214°, isolated from leaves and stems (*Agric. Biol. Chem.* 1967, 31, 1108; *Chem. Abstr.* 1968, 68, 40020 s).

NEW COMPOUNDS

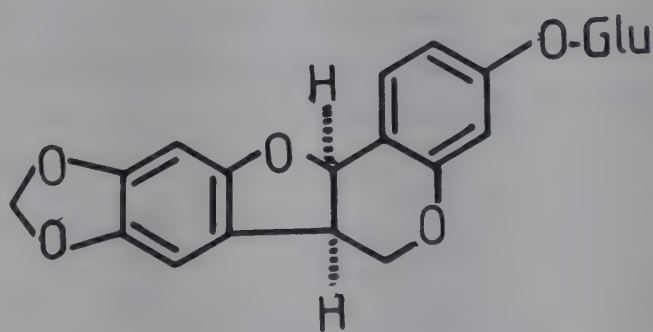


I

$R = \text{COCH}_2\text{COOH}, R' = \text{Glu}, R'' = \text{H}$

Pratensein

$R, R' = \text{H}, R'' = \text{OH}$

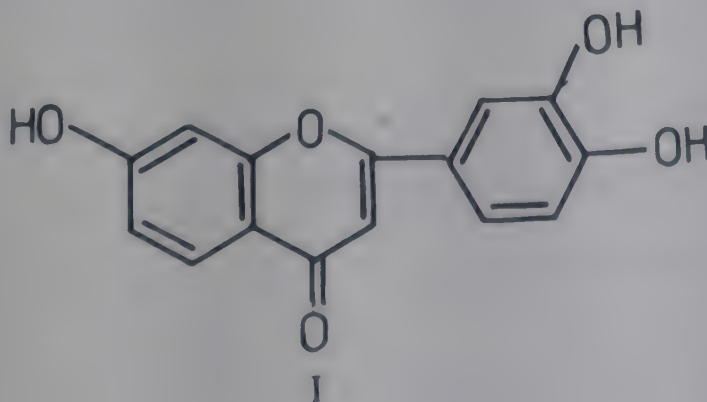


Trifolirhizin

T. repens L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 248).

3',4',7-Trihydroxyflavone (I), mp. 318°, isolated (*J. Pharm. Sci.* 1964, 53, 1557).

NEW COMPOUNDS



TRIGONELLA (Papilionaceae)

T. corniculata (L.) L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 248).

Yuccagenin and diosgenin from seeds (*J. Indian Chem. Soc.* 1969, 46, 391).

T. foenum-graecum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 248).

Two flavonoid glycosides, quercetin and luteolin, and two steroidal saponins from seeds identified by PC; saponins on hydrolysis yielded diosgenin and gitogenin in 9:1 ratio (*J. Indian Chem. Soc.* 1966, 43 564).

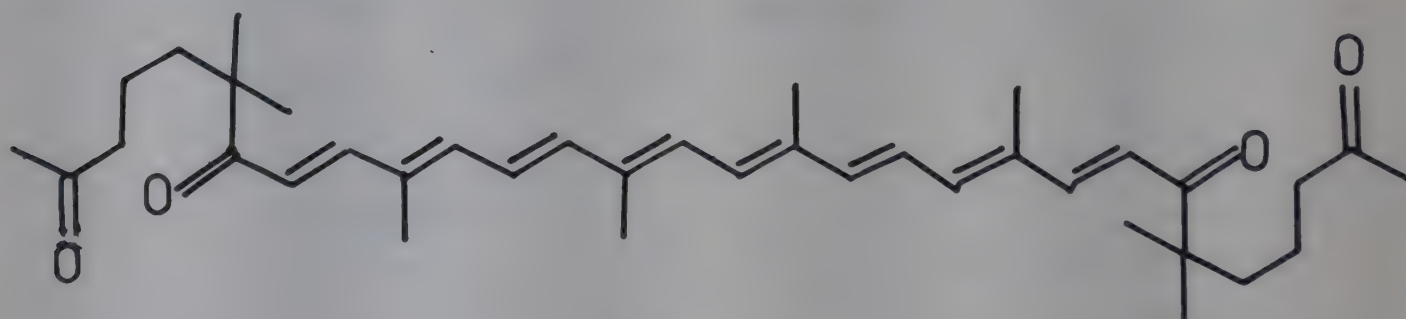
TRIPHASIA (Rutaceae)

T. trifolia (Burm.f.) P. Wils. syn. *T. trifoliata* DC.

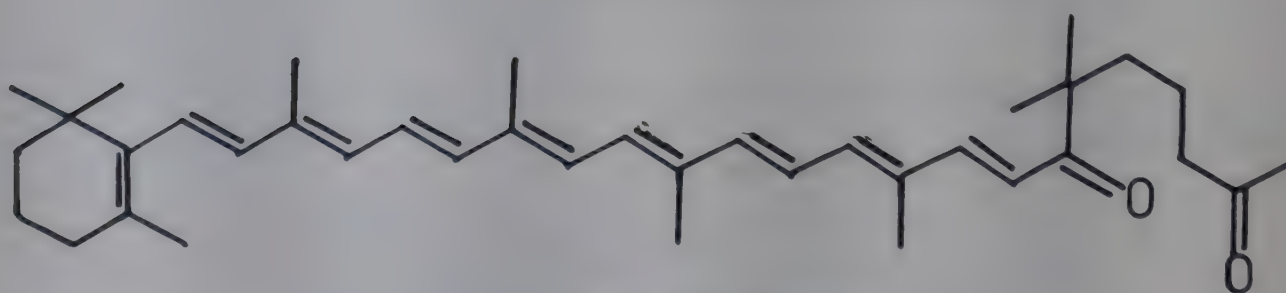
Eng. - Lime berry; H. - Chini narangi.

Semi- β -carotenone and β -carotenone isolated (*Phytochemistry* 1968, 7, 1031).

Distribution : Planted in gardens as ornamental. It has run wild in some parts of peninsular India and Car Nicobar Islands.

NEW COMPOUNDS

β -Carotenone



Semi- β -carotenone

T. trifoliata DC.; see *T. trifolia* (Burm.f.) P. Wils.

TROPAEOLUM (Tropaeolaceae)

T. majus L.

Isoquercitrin from leaves (*C.R. Acad. Sci. Paris, Ser. D.* 1961, 252, 1510; *Chem. Abstr.* 1961, 55, 14590 b).

Distribution : Native of South America, grown as ornamental in gardens; has also run wild in hill stations of India.

TURBINA (Convolvulaceae)

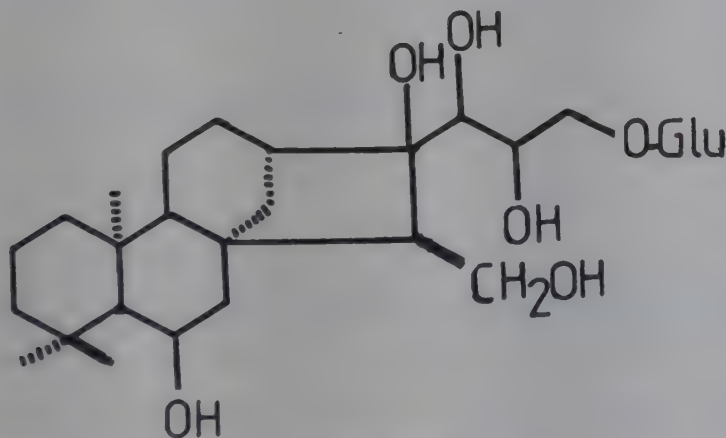
T. corymbosa (L.) Rafin. syn. *Rivea corymbosa* Hailler f.

Eng. - Snake plant, Ololiuqui.

Isolation and structure of new glucoside - turbicoryn, mp. 240° - from seeds (*Tetrahedron* Lett. 1960, 30; *Tetrahedron* 1964, 20, 2999; *Tetrahedron* Lett. 1965, 621); a glucoside - corymbosin - isolated, its structure and partial stereochemistry of its aglycone established (*Tetrahedron* 1967, 23, 2557)

Distribution : Native of tropical America, introduced as an ornamental in gardens in Bombay, Pune and Belgaum and naturalised in Bombay and elsewhere.

NEW COMPOUNDS



Turbicoryn

TUSSILAGO (Asteraceae)

T. farfara L (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 249).

Extract of leaves showed spasmolytic effect on isolated rabbit intestine (*Acta Pol. Pharm.* 1959, 16, 347; *Chem. Abstr.* 1960, 54, 13424 c).

Sterol, mp. 139°, isolated from flowers (*Rocz. Chem.* 1967, 41, 201; *Chem. Abstr.* 1967, 67, 784 s).

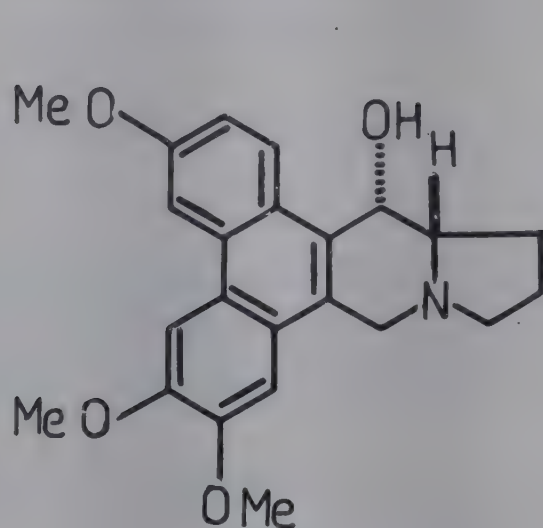
TYLOPHORA (Asclepiadaceae)

T. asthmatica W. & A.; see *T. indica* (Burm.f.) Merrill

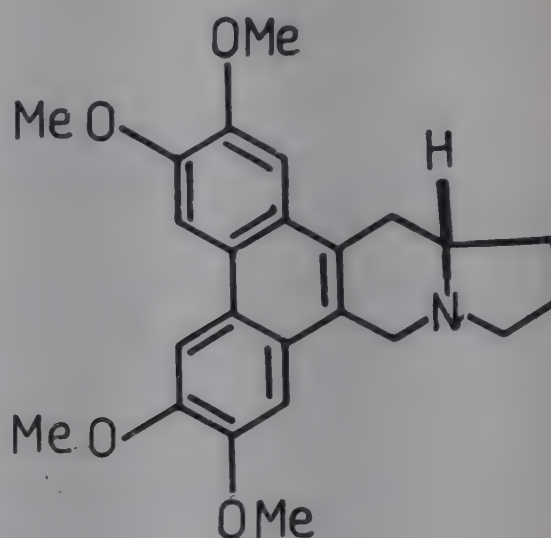
T. indica (Burm.f.) Merrill syn. *T. asthmatica* W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 250).

Structure of tylophorine as 2,3,6,7-tetramethoxyphenanthro[9,10:6',7']indolizidine confirmed by synthesis (*Tetrahedron* 1960, 9, 53; *ibid.* 1961, 14, 284); structure of tylophorinine confirmed by synthesis (*Tetrahedron* 1965, 21, 2573; *J. Sci. Ind. Res.* 1965, 24B, 108); α -amyrin, tylophorine, kaempferol and quercetin from leaves (*Curr. Sci.* 1968, 37, 432).

NEW COMPOUNDS



Tylophorinine



Tylophorine

TYLOPHORUM (Papaveraceae)

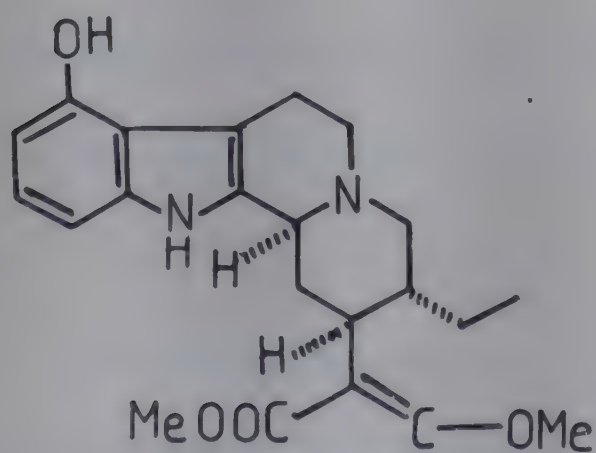
T. lactucoides (Hook.f. & Thoms.) Benth. & Hook.f.; see *Dicranostigma lactucoides* Hook.f. & Thoms.

UNCARIA (Rubiaceae)

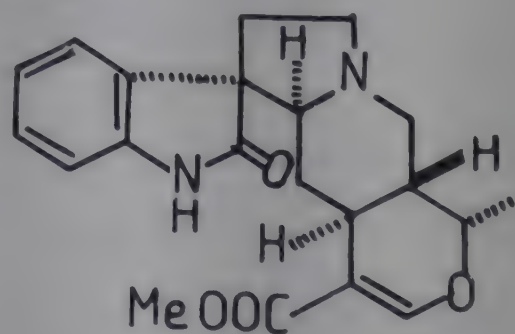
U. gambir (Hunt.) Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 250).

A new indole alkaloid - gambirine, mp. 163° - from leaves (*Tetrahedron Lett.* 1967, 1571); configuration of mitraphylline (*Tetrahedron Lett.* 1966, 4883); two new stereoisomers of mitraphylline - gambiridine, mp. 199° and isogambiridine - together with mitraphylline isolated from stems and their structures determined (*Tetrahedron Lett.* 1968, 3403).

NEW COMPOUNDS



Gambirine



Mitraphylline

URARIA (Papilionaceae)

U. lagopoides DC.; see *U. lagopodioides* (L.) Desv.

U. lagopodioides (L.) Desv. syn. *U. lagopoides* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 250).

Aqueous extract of leaves showed antiimplantation activity (*Indian J. Med. Res.* 1969, 57, 237).

URTICA (Urticaceae)

U. parviflora Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 251).

Histamine, 5-hydroxytryptamine and acetylcholine detected in leaves (*Can. J. Physiol. Pharmacol.* 1965, 43, 869).

USNEA (Usneaceae)

U. venosa Mot.

d-USnic and barbatic acids, a carotene and ergosterol isolated (*J. Sci. Ind. Res.* 1959, 18B, 394).

Distribution : Nilgiris and Palni Hills in south India.

U. flexilis Stirt.; see *U. himalayana* Bab.

U. himalayana Bab. syn. *U. flexilis* Stirt.

d-USnic, barbatic and norstictic acids isolated (*J. Sci. Ind. Res.* 1961, 20B, 611).

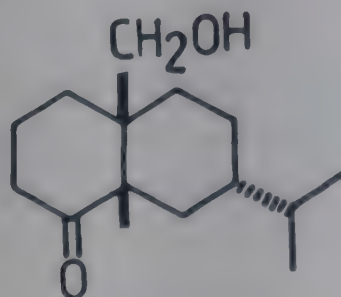
Distribution : Temperate Himalayas, Nilgiris and Palni Hills in south India.

VALERIANA (Valerianaceae)

V. jatamansi Jones syn. *V. wallichii* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 252).

Isovaleric and caproic acids obtained from alkaline hydrolysate of a compound isolated from rhizomes and roots (*Arzneim. Forsch.* 1962, 12, 12); isolation and structure of hydroxyvaleranone and acetoxyvaleranone (*Tetrahedron* 1964, 20, 1289); a new flavonoid - linarin isovalerate - isolated (*Planta Med.* 1968, 16, 361).

NEW COMPOUNDS



Hydroxyvaleranone

V. wallichii DC.; see *V. jatamansi* Jones

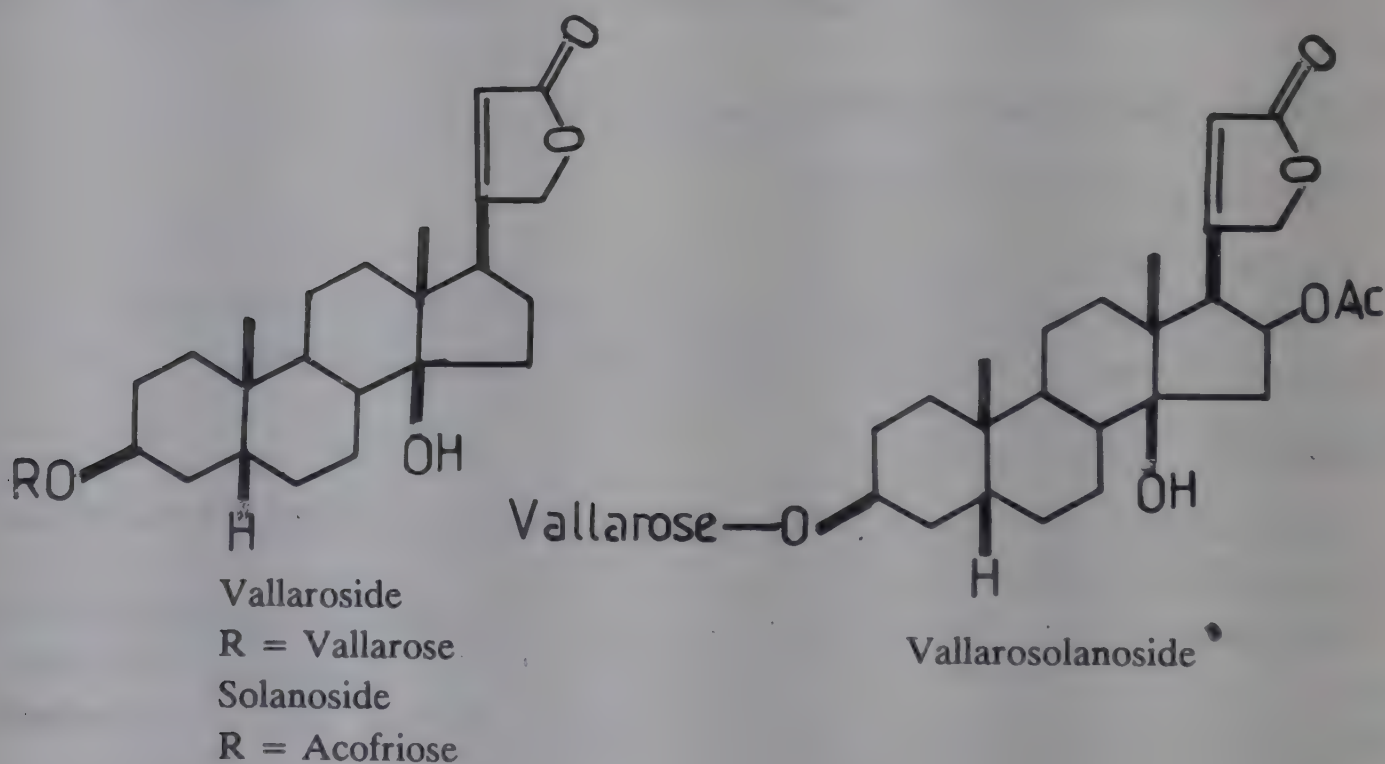
VALLARIS (Apocynaceae)

V. heynei Spreng.; see *V. solanacea* (Roth) O. Ktze.

V. solanacea (Roth) O. Ktze. syn. *V. heynei* spreng. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 252).

Glucoside mixture from leaves possessed powerful digitalis-like activity in addition to general musculotropic activity on smooth muscle. It also caused emesis (*J. Sci. Ind. Res.* 1961, 20C, 161).

Acoschimperoside P, vallaroside, mp. 122°, solanoside, mp. 219°, their monoacetates and vallarosolanoside, mp. 230°, isolated from seeds; vallaroside characterised as digitoxigenin- α -L-vallaropyranoside, solanoside as digitoxigenin- α -L-acofriopyranoside, and vallarosolanoside as oleandrigenin- α -L-vallaropyranoside (*Helv. Chim. Acta* 1965, 48, 65, 83).

NEW COMPOUNDS**VANDA** (Orchidaceae)

V. roxburghi R. Br.; see *V. tessellata* (Roxb.) Hook. ex G. Don.

V. tessellata (Roxb.) Hook. ex G. Don. syn. *V. roxburghi* R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 252).

β - And γ -sitosterols and a long chain aliphatic compound, mp. 85°, isolated (*J. Indian Chem. Soc.* 1967, 44, 804).

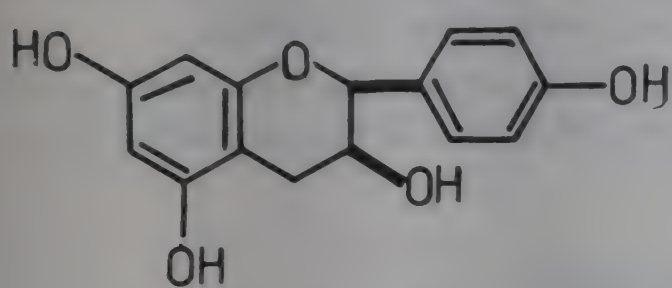
VATERIA (Dipterocarpaceae)

V. indica L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 253).

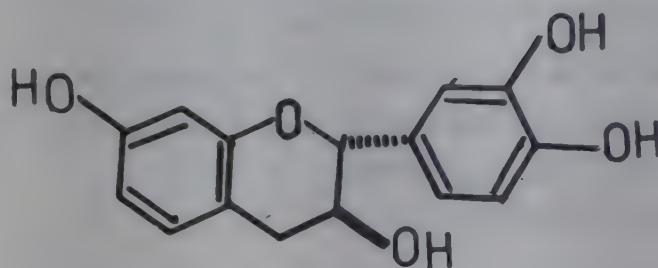
dl-Epicatechin, mp. 224°, fisetinidol, mp. 205° and afzelechin, mp. 300°, from bark (*Leather*

Sci. 1968, 15, 114; *Chem. Abstr.* 1968, 69, 77066 h).

NEW COMPOUNDS



Afzelechin



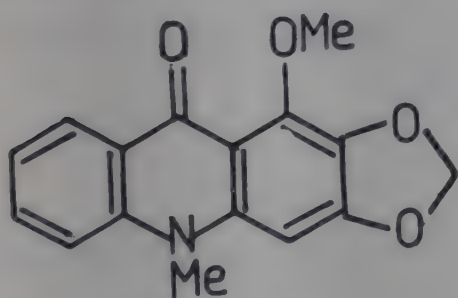
Fisetinidol

VEPRIS (Rutaceae)

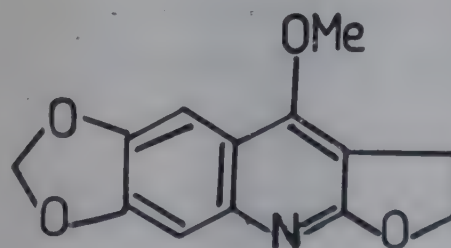
V. bilocularis (W. & A.) Engler syn. *Toddalia bilocularis* W. & A. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 253).

Alkaloids and a limonoid - veprisone - isolated from stem bark; latter identified as methyl epiisoacunoate (*Tetrahedron* 1964, 20, 2985); besides kokusaginine, flindersiamine and skimmianine, new alkaloids - evoxanthine, mp. 225°, 1,3-dimethoxy-N-methylacridone, mp. 158°, 1,2,3-trimethoxy-N-methylacridone, mp. 168°, 1-hydroxy-2,3-dimethoxy-N-methylacridone, mp. 175° and maculine, mp. 195° - isolated from bark (*Indian J. Chem.* 1966, 4, 334).

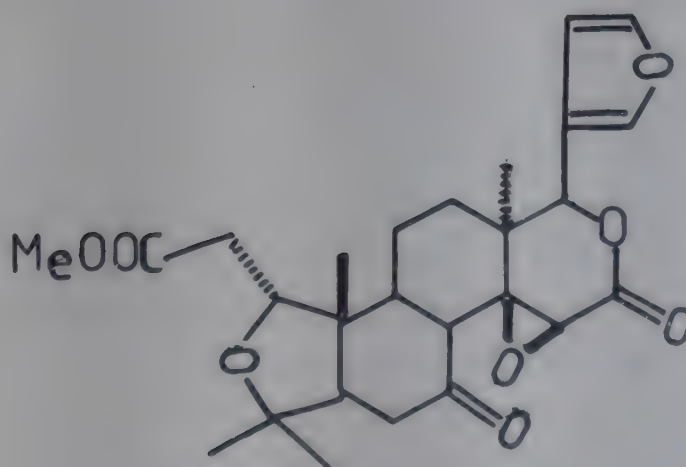
NEW COMPOUNDS



Evoxanthine



Maculine



Veprisone

VERBENA (Verbenaceae)

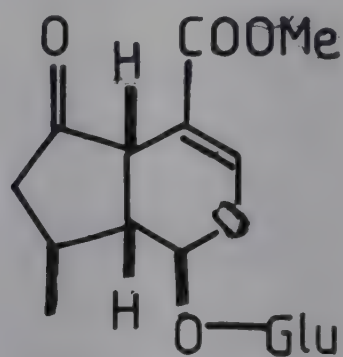
V. officinalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi,

1956, p. 253).

Plant extract showed marked antiphlogistic action on conjunctivitis in rabbits caused by mustard oil (*Gifu Ika Daigaku Kiyo* 1963, 11, 6; *Chem. Abstr.* 1964, 60, 16384 g).

Isolation and structure of verbenalin, mp. 182°, from leaves along with adenosine and β -carotene (*Tetrahedron Lett.* 1960, 5; *Arch. Pharm.* 1961, 294, 220; *Chem. Abstr.* 1961, 55, 14822 g; *Tetrahedron* 1962, 18, 1049).

NEW COMPOUNDS



Verbenalin

VERNONIA (Asteraceae)

V. cinerea (L.) Less. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 254).

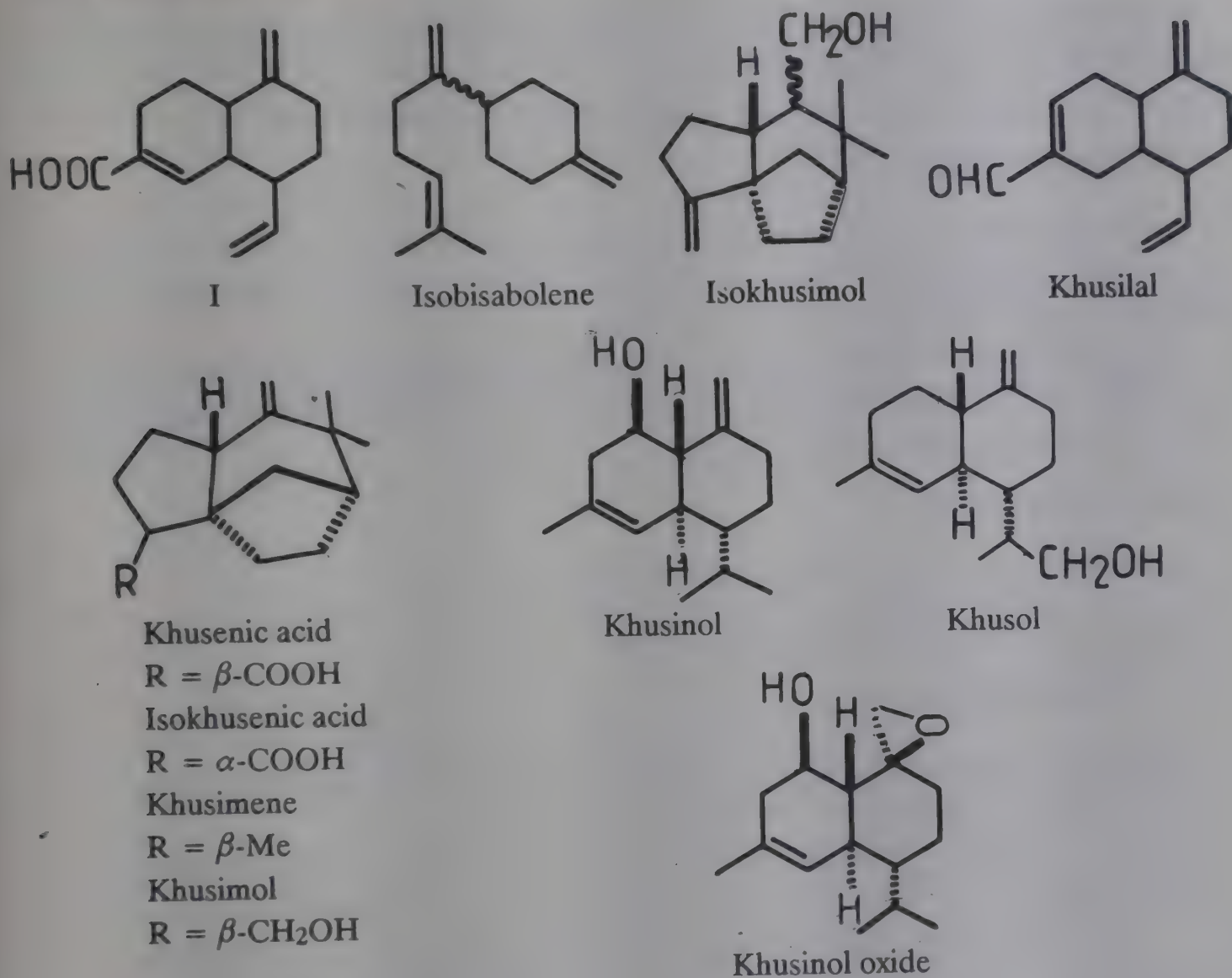
β -Amyrin acetate, β -amyrin benzoate, lupeol and its acetate, β -sitosterol, stigmasterol and α -spinasterol isolated (*J. Indian Chem. Soc.* 1962, 39, 749).

VETIVERIA (Poaceae)

V. zizanioides (L.) Nash syn. *Andropogon squarrosus* Hook.f. (non L.f.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 254).

New sesquiterpene hydrocarbon - isobisabolene, bp. 99°/8 mm. - from oil (*Tetrahedron* 1962, 18, 1165); khusol isolated from oil and its structure elucidated (*Tetrahedron* 1963, 19, 1073); khusinol, mp. 87°, from vetiver oil (*Tetrahedron* 1963, 19, 233; structure of khusilal (*Tetrahedron* 1964, 20, 2617); a new epoxy alcohol - khusinol oxide - isolated from oil and its structure established (*Tetrahedron* 1967, 23, 1267; *Can. J. Chem.* 1972, 50, 3272); khusenic and isokhusenic acids isolated from oil found to be identical with zizanoic and epizizanoic acids respectively (*J. Pharm. Sci.* 1967, 56, 1299; *J. Org. Chem.* 1968, 33, 1771; *Tetrahedron Lett.* 1967, 2815); khusimene isolated from oil (*Nippon Kagaku Zasshi* 1967, 88, 795; *Chem. Abstr.* 1968, 69, 10554 x); a sesquiterpenic tricyclic alcohol - khusenol, bp. 140°/0.7 mm. - isolated from root oil found to be identical with khusimol (*J. Pharm. Sci.* 1968, 57, 1029; *Perfum. Essent. Oil Record* 1969, 60, 307; *Chem. Abstr.* 1970, 72, 55679 v); revised structure of khusinol (*Sci. Cult.* 1969, 35, 27); crystal structure of khusimol (*Chem. Commun.* 1969, 999); isokhusimol, bp. 158°/0.3 mm., isolated from high boiling fraction of oil (*Perfum. Essent. Oil Record* 1969, 60, 314; *Chem. Abstr.* 1970, 72, 43897 b); a sesquiterpene acid (I) from root oil (*Curr. Sci.* 1969, 38, 363).

NEW COMPOUNDS

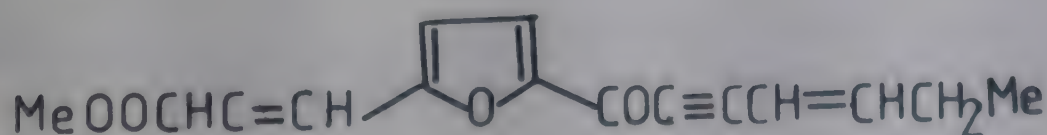


VICIA (Papilionaceae)

V. faba L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 254).

Acetylenic oxoester (I), mp. 63° , isolated from 8-day-old seedlings (*Chem. Commun.* 1965, 422); compound P-2 and β -[3-(β -D-glucopyranosyloxy)-4-hydroxyphenyl]-L-alanine from seeds; P-2 on hydrolysis yielded dopa and glucose in equimolar ratio (*Nature* 1965, 205, 1213); δ -hydroxylysine isolated from unripe pods (*Meiji Daigaku Kogakubu Kenkyu Hokoku* 1967, 1; *Chem. Abstr.* 1968, 69, 103800 q).

NEW COMPOUNDS



I

V. sativa L.

H. - Akra, Ankra, Akta; B. - Ankari; Oriya - Rothi, Choni; Delhi - Chatri-matri, Matra;

Bihar - Chirinji, Chirinji arxa.

γ -L-Glutamyl- β -alanine, mp. 100° and γ -L-glutamyl- γ -aminobutyric acid, mp. 189°, from young pods (*Bull. Acad. Pol. Sci. Ser. Sci. Biol.* 1968, 16, 615; *Chem. Abstr.* 1969, 70, 75060 y). Distribution : Northern and eastern India ascending to 2250 m. and Nilgiris.

VIGNA (Papilionaceae)

V. radiata (L.) Wilczek var. *radiata* syn. *Phaseolus radiatus* L., *P. aureus* Roxb., *P. radiatus* L. var. *aureus* (Roxb.) Prain, *P. mungo* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 190).

A saponin, mp. 215°, isolated from leaves (*Nippon Nogei Kagaku Kaishi* 1964, 38, 273; *Chem. Abstr.* 1965, 62, 16359 f); methionine, tryptophan and tyrosine from beans (*Philippine J. Sci.* 1964, 93, 47; *Chem. Abstr.* 1965, 62, 8119 b).

VINCA (Apocynaceae)

V. pusilla Murr.; see *Catharanthus pusillus* (Murr.) G. Don

V. rosea L.; see *Catharanthus roseus* (L.) G. Don

VINCETOXICUM (Asclepiadaceae)

V. album (Mill.) Aschers syn. *Cynanchum vincetoxicum* Pers. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 87).

6,7-(Trimethoxy-9,10-dehydro-9,10-phenanthro)-indolizidine isolated from roots (*Acta Pharm. Hung.* 1967, 37, 186; *Chem. Abstr.* 1968, 68, 114794 w); chlorogenic and sinapic acids from roots (*Planta Med.* 1967, 15, 194); tylophorine along with 2,3,6-trimethoxy- and 6-hydroxy-2,3-dimethoxy-9,11,12,13,13a,14-hexahydrodibenzo[f,h]pyrrolo[1,2,-b]isoquinoline from aerial parts (*Ann. Chem.* 1969, 721, 154); triterpenes (probably α - or β -amyrin) and sitosterol isolated (*Planta Med.* 1969, 17, 35).

VIOLA (Violaceae)

V. odorata L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 255).

A compound, mp. 188° and odoratine, mp. 62°, from roots and rhizomes (*Acta Pol. Pharm.* 1961, 18, 187; *Chem. Abstr.* 1962, 57, 7381 d).

V. tricolor L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 256).

An anthocyanin - violanin - composed of glucose and rhamnose (2:1), p-coumaric acid and delphinidin (*Bot. Mag.* 1963, 76, 206; *Chem. Abstr.* 1964, 60, 9347 g).

VISCUM (Loranthaceae)

V. album L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi,

1956, p. 256).

Oleanolic acid, β -amyrin, mesoinositol (1.5%) and four flavonoids, mp. 208° , 107° , 142° and 219° , isolated (Yao Hsueh Hsueh Pao 1957, 5, 169; *Chem. Abstr.* 1962, 56, 10587 c); arginine (40.2), asparagine (11.3), proline (10.2%) and other free amino acids isolated from fruits; total content of free amino acids was 14.0 mg/g of fresh juice or 4.3 mg/g of fresh plant material (*Z. Physiol. Chem.* 1960, 322, 273; *Chem. Abstr.* 1961, 55, 10494 h).

BIOLOGICAL ACTIVITY

Viscum acid showed antitumor activity (Ger. 1,130,112 (1962) May 24; *Chem. Abstr.* 1962, 57, 11318 c).

V. articulatum Burm. f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 256).

Oleanolic acid and inositol isolated (*Curr. Sci.* 1965, 34, 406).

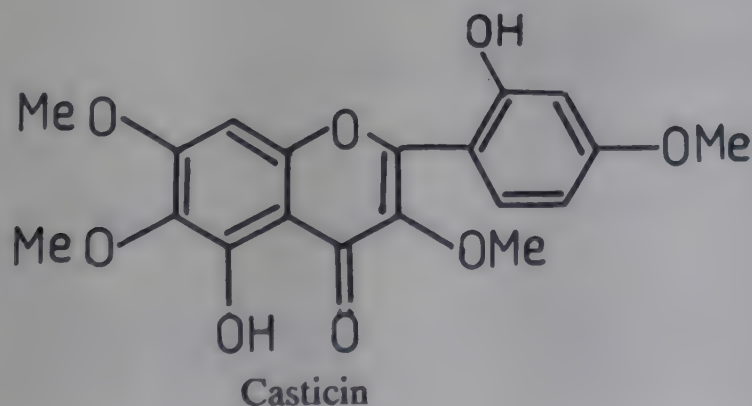
VITEX (Verbenaceae)

V. agnus-castus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 256).

Seed oil showed progesterone-like effect in mature female rats (*Vestnik Sloven. Kemi. drustva.* 1958, 5, 63; *Chem. Abstr.* 1960, 54, 19959 a).

Casticin, mp. 186° , characterised as 5,2'-dihydroxy-3,6,7,4'-tetramethoxyflavone (*J. Chem. Soc.* 1961, 2523).

NEW COMPOUNDS



V. altissima L.f.

Mar. - Balage, Banalgay; Tel. - Nemiliadogu; Tam. - Maila, Mayilai; Kan. - Myrole, Bulgi, Balagay; Mal. - Mayila; Assam - Ahoi, Ashoi, Jharua; Coorg - Naviladi.

Vitexin (0.02-0.08%) isolated from leaves, bark and heartwood (*Naturwiss.* 1965, 52, 262; *Chem. Abstr.* 1965, 63, 4660 c).

Distribution : Assam, Meghalaya and Deccan Peninsula, upto 1200 m. in hills.

V. peduncularis Wall. ex Schauer (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 257).

Vitexin (0.02-0.08%), mp. 265° , isolated from bark; its structure established as 8-C-glucosylapigenin (*J. Sci. Ind. Res.* 1962, 21B, 313; *Naturwiss.* 1965, 52, 262; *Chem. Abstr.*

1965, 63, 4600 c).

V. trifolia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 257).

A new alkaloid - vitricin (0.01%), mp. 237° - isolated (*Naturwiss.* 1962, 49, 375; *Chem. Abstr.* 1962, 57, 13814 g).

VITIS (Vitaceae)

V. quadrangularis Wall. ex Wight; see *Cissus quadrangularis* L.

V. vinifera L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 257).

Anthocyanin pigments investigated by PC; these were identified as 3-monoglucosides of malvidin, peonidin, delphinidin and petunidin, acylated with either p-coumaric acid or caffeic acid (*J. Food. Sci.* 1965, 30, 69; *Chem. Abstr.* 1965, 62, 9459 f); (+)catechin, (-)epicatechin and (-)epicatechin-3-gallate isolated (*Phytochemistry* 1969, 8, 1553).

VOLUTARELLA (Asteraceae)

V. divaricata Benth. & Hook.f.; see *Oligochaeta racemosa* (Roxb.) Wagenitz

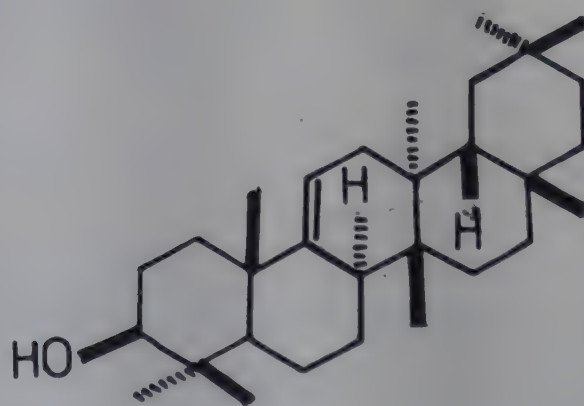
WALSURA (Meliaceae)

W. tubulata Hiern

Isolation and structure of a new pentacyclic triterpene alcohol - walsurenol (*Chem. Commun.* 1968, 418).

Distribution : Sikkim Himalayas and Khasi Hills.

NEW COMPOUNDS



Walsurenol

WALTHERIA (Sterculiaceae)

W. americana L.; see *W. indica* L.

W. indica L. syn. *W. americana* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 258).

NEW COMPOUNDS

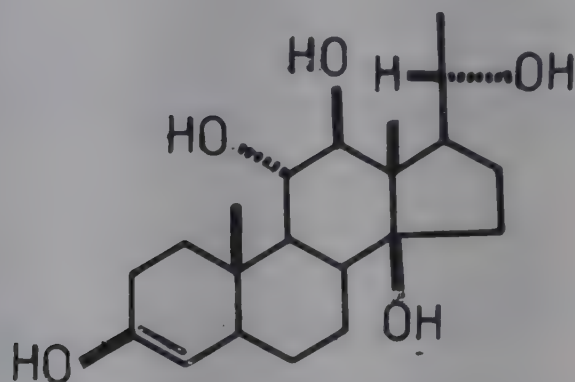


Adouetine Z sulfamate did not exhibit antipyretic activity although it induced hypothermia and sedation at low and hyperexcitability at high doses; LD50 in mice 52.5 mg/kg (*Ann. Pharm. Fr.* 1963, 21, 147; *Chem. Abstr.* 1963, 59, 2077 e).

W. volubilis (L.f.) Stapf syn. *Dregea volubilis* (L.f.) Benth. ex Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 258).

Drevogenin D, mp. 227°, isolated from seeds and characterised as 3 β ,11 β ,12 β ,14 β ,20 ξ -pentahydroxypregn-5-ene (Helv. Chim. Acta 1965, 48, 649, 857); hydrolysate of seed extract yielded drevogenins B, mp. 224°, D, and P, mp. 122°, D-cymarose, (+)methyl pachybioside, oleandrose, pachybiose and digitoxose (Helv. Chim. Acta 1966, 49, 1625).

NEW COMPOUNDS



Drevogenin D

WEBERA (Rubiaceae)

W. corymbosa Willd.; see *Tarenna asiatica* (L.) Kuntze ex K. Schum.

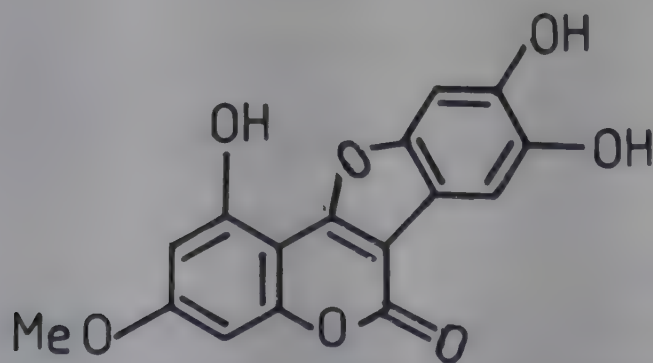
WEDELIA (Asteraceae)

W. cadendulacea Less; see *W. chinensis* (Osbeck) Merr.

W. chinensis (Osbeck) Merr. syn. *W. cadendulacea* Less (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 258).

Isolation of wedelolactone (*J. Sci. Ind. Res.* 1965, 24B, 108).

NEW COMPOUNDS



Wedelolactone

WITHANIA (Solanaceae)

W. coagulans (Stocks.) Dunal (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 258).

Compounds mp. 125°, 90°, 81° and 128° isolated from fruits (*Indian J. Pharm.* 1965, 27, 178; *Planta Med.* 1965, 11, 145).

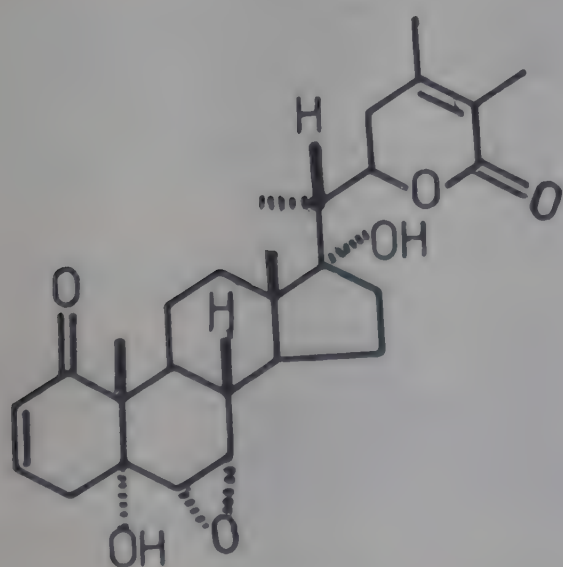
W. somnifera (L.) Dunal (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 258).

Total alkaloidal fraction of root extract from cultivated plants showed prolonged hypoten-

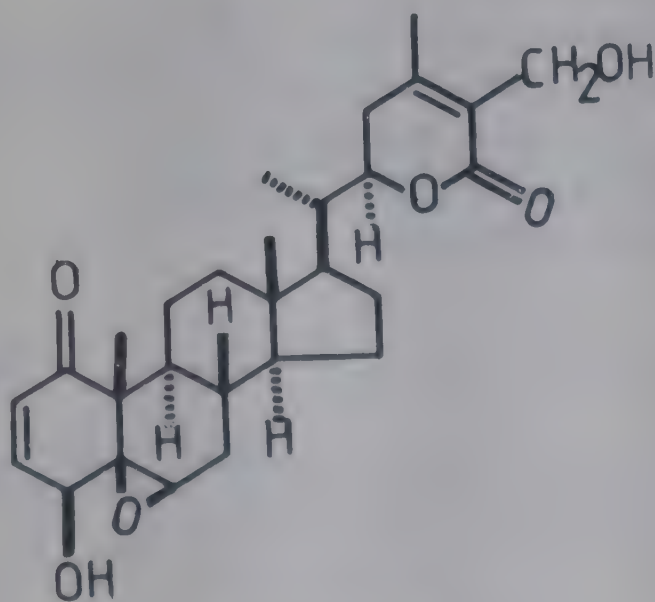
sive, bradycardiac and respiratory stimulant activities in dogs. Hypotensive effect was mainly due to autonomic ganglion-blocking action and was augmented by the depressant action on higher cerebral centres. It stimulated vasomotor and respiratory centres in brain of dog. This fraction was more than twice as active as total extract (*Indian J. Med. Res.* 1961, 49, 448). No adverse or toxic effects observed clinically or biochemically in cases of acute rheumatoid arthritis at a dose of 6g root powder/day for 30 days (*Indian J. Med. Res.* 1968, 56, 1581).

Presence of eight alkaloids detected by PC (*J. Chromatog.* 1960, 3, 591; *Chem. Abstr.* 1961, 55, 4883 g); somnitol, glucose, inorganic salts and a new compounds - withanone, mp. 263° - isolated from leaves; detection of cystine, glycine, glutamic acid, α -alanine, proline, tryptophan by PC (*J. Pharm. Sci.* 1961, 50, 876); anaferine, mp. 222°, isolated from roots and characterised as bis(2-piperidylmethyl) ketone (*Chem. Ind.* 1962, 654; *Lloydia* 1963, 26, 258; *Experientia* 1965, 21, 249; *Ann. Chem.* 1970, 737, 1); isopelletierine HCl, mp. 145°, from roots (*J. Pharm. Sci.* 1962, 51, 1196); five nitrogen-free compounds - A₁, mp. 238°, A₂, mp. 243°, A₃, mp. 225°, A₄, mp. 240° and A₅, mp. 271° - isolated from leaves (*Antibiot. Chemotherapy* 1962, 12, 576; *Chem. Abstr.* 1963, 58, 1718 h); withaferin isolated (*J. Chem. Soc.* 1962, 2925); tropine, pseudotropine, 3 α -tigloyloxytropene, mp. 181°, cuscohygrine, dl-isopelletierine, anahygrine and hygrine from roots (*Lloydia* 1963, 26, 258; *ibid.* 1963, 25, 44; *Experientia* 1965, 21, 249); structure of anahygrine, bp. 106°/0.2 mm., isolated from root, confirmed by synthesis (*Chem. Ind.* 1964, 283; *Experientia* 1965, 21, 249); structure and stereochemistry of withaferin A isolated along with its dihydro derivative from leaves; withaferin identified as 2,3-dihydro-3-methoxywithaferin A (*J. Chem. Soc. C* 1965, 7517; *ibid.* 1966, 1753); a new withaferin A isomer - 27-deoxy-14-hydroxy-withaferin A - from leaves (*J. Chem. Soc. C* 1966, 1765); a pyrazole alkaloid - withasomnine - isolated from roots (*Tetrahedron* 1966, 22, 2895); withanolide D isolated and characterised as 5,6-epoxy-4 β ,2 α -dihydro-1-oxo-(5 β)-witha-2,24-dienolide (*Israel J. Chem.* 1969, 6, 671; *Chem. Abstr.* 1969, 71, 30619 s; *Tetrahedron* 1970, 26, 2209); crystal structure of withaferin A (*J. Chem. Soc. B* 1968, 962).

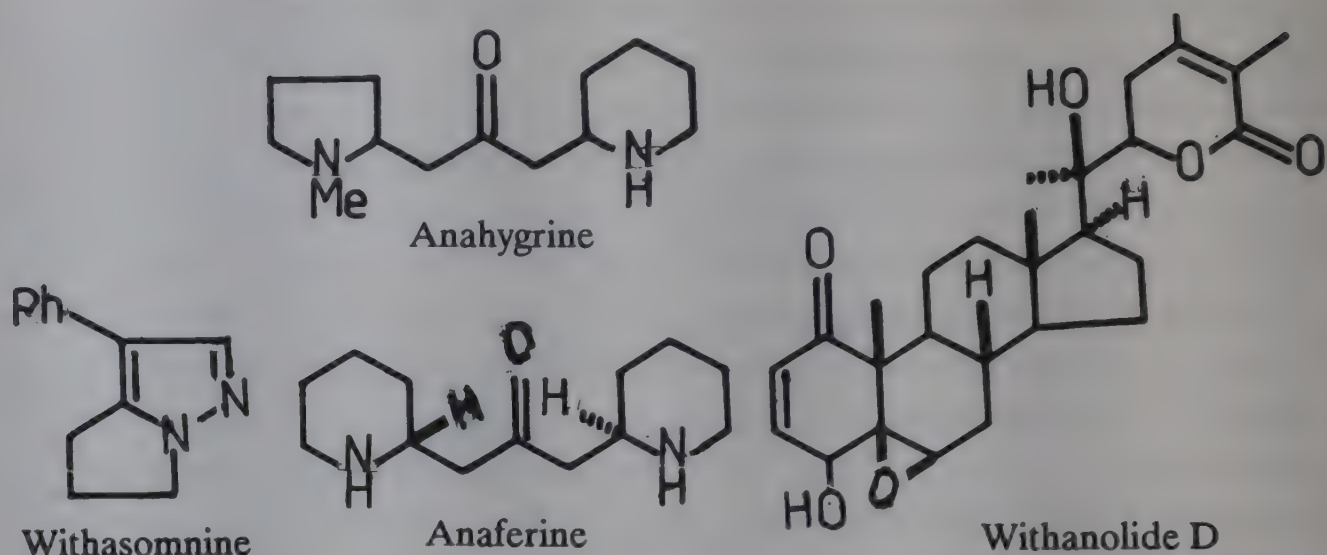
NEW COMPOUNDS



Withanone



Withaferin A



BIOLOGICAL ACTIVITY

In vitro and in vivo antibacterial activity against 13 organisms investigated; A₁, A₂, A₃ and to lesser extent A₄ and A₅, were effective against aerobic bacilli. None of them was active against Gram-negative bacteria and anaerobic bacilli (*Antibiot. Chemotherapy* 1962, 12, 576; *Chem. Abstr.* 1963, 58, 1718 h); an unsaturated lactone, mp. 159°, was active in a concentration of 10 γ /ml against acid-fast bacilli and pathogenic fungi but was inactive against Gram-negative organisms (*Diss. Pharm.* 1963, 14, 501; *Chem. Abstr.* 1963, 59, 6866 g).

WRIGHTIA (Apocynaceae)

W. tinctoria R. Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1965, p. 259).

β -Sitosterol, β -amyirin and its acetate and lupeol benzoate from bark (*Proc. Indian Acad. Sci.* 1963, 57A, 115; *Chem. Abstr.* 1963, 59, 5204 d).

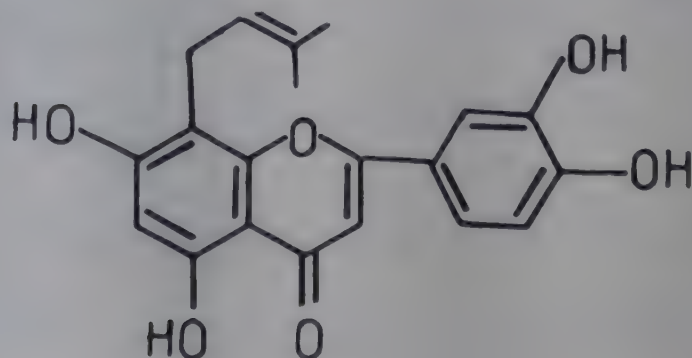
XANTHIUM (Asteraceae)

X. spinosum L.

Flavonoid A, mp. 209°, isolated and characterised as 8-(3-methyl-2-buten-1-yl)-5,7,3',4'-tetrahydroxyflavone (I) (*Farm. Zh.* 1966, 21, 44; *Chem. Abstr.* 1966, 65, 5871 f; *ibid.* 1966, 21, 47; *Chem. Abstr.* 1967, 66, 49239 m).

Distribution : West Bengal and Assam.

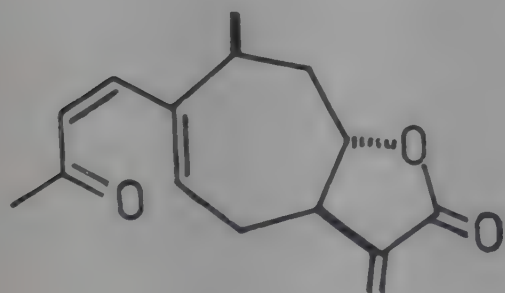
NEW COMPOUNDS



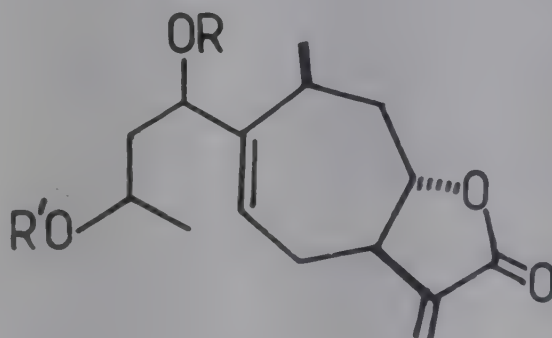
X. strumarium L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 259).

Strumaroside, mp. 290° , from fruits identified as β -sitosterol glucoside (*Indian J. Appl. Chem.* 1961, 24, 197; *Chem. Abstr.* 1963, 58, 4810 a); xanthatin, mp. 109° and xanthinin, mp. 110° , isolated and characterised (*Farm. Zh.* 1964, 19, 16, 50; *Chem. Abstr.* 1966, 64, 5442 h, 7040 b); a sesquiterpenoid - xanthumin, mp. 100° - isolated from aerial parts; its structure and stereochemistry determined (*Jpn.* 21,478, (1966) Dec. 15; *Chem. Abstr.* 1967, 66, 68922 v; *J. Chem. Soc. C* 1965, 7009); stigmasterol from fruits (*Chem. Pharm. Bull.* 1965, 13, 379); isolation of flavonoid A, mp. 209° (*Farm. Zh.* 1966, 21, 47; *Chem. Abstr.* 1967, 66, 49239 m); two new sesquiterpene lactones - xanthanol and isoxanthanol - isolated and related to xanthinin and ivalbin (*J. Org. Chem.* 1969, 34, 153).

NEW COMPOUNDS



Xanthatin

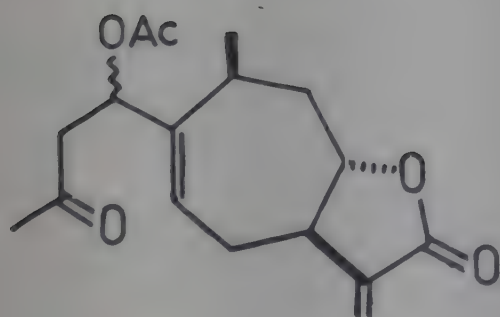


Xanthanol

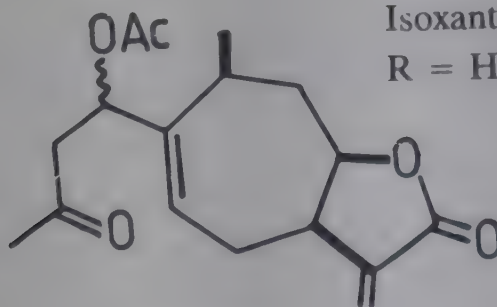
R = Ac, R' = H

Isoxanthanol

R = H, R' = Ac



Xanthinin



Xanthumin

BIOLOGICAL ACTIVITY

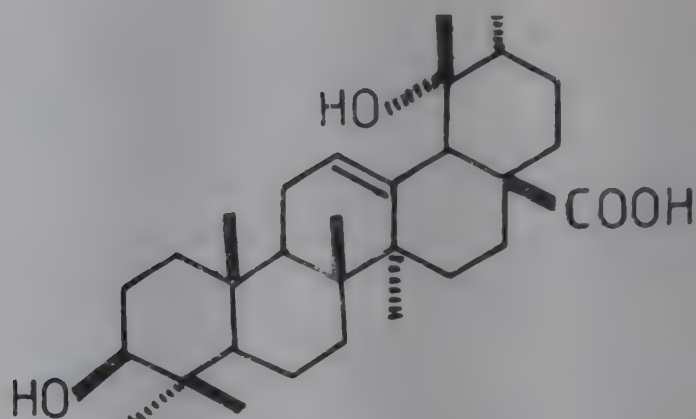
Xanthumin showed CNS depressant activity (*Jpn.* 21,478 (1966) Dec. 15; *Chem. Abstr.* 1967, 66, 68922 v).

XEROMPHIS (Rubiaceae)

X. spinosa (Thunb.) Keay syn. *Randia dumetorum* Lamk. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 209).

Mannitol, and saponins from bark; hydrolysis of saponins yielded randialic acid B, mp. 256° , from a mixture of aglycones, glucose, xylose and rhamnose (*Indian J. Chem.* 1966, 4, 483).

NEW COMPOUNDS



Randialic acid B

X. uliginosa (Retz.) Maheshwari syn. *Randia uliginosa* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 209).

Mannitol and leucoanthocyanidin from fruits; hydrolysis of fruit extract yielded oleanolic acid (*Curr. Sci.* 1965, 34, 505).

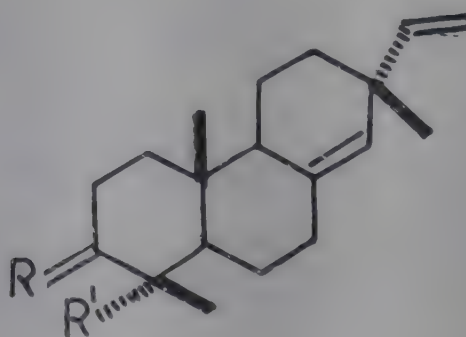
XYLIA (Mimosaceae)

X. dolabriformis Benth.; see *X. xylocarpa* (Roxb.) Taub. (*X. dolabriformis* is now considered to be Burmese species and distinct from *X. xylocarpa*).

X. xylocarpa (Roxb.) Taub. syn. *X. dolabriformis* Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 259).

Diterpenes - manoyl oxide, 3-oxomanoyl oxide, sandaracopimaradien-3-one, -3 β -ol and -3 β ,18-diol - from heartwood (*J. Chem. Soc.* 1963, 644).

NEW COMPOUNDS



Sandaracopimaradien-3-one

R = O, R' = Me

Sandaracopimaradien-3 β -ol

R = H, β -OH, R' = Me

Sandaracopimaradien-3 β , 18-diol

R = H, β -OH, R' = CH₂OH

YUCCA (Liliaceae)

Y. aloifolia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi,

1956, p. 259).

Tigogenin ($5\alpha,25R$ -spirostan- 3β -ol) (0.55%) mp. 203° , isolated from leaves (*J. Chem. U.A.R.* 1961, 4, 101; *Chem. Abstr.* 1962, 57, 8635 i).

Y. gloriosa L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 259).

Tigogenin and a dioxysapogenin, mp. 257° , obtained by acid hydrolysis of extract from leaves (*Khim. Prir. Soedin.* 1968, 4, 355; *Chem. Abstr.* 1969, 70, 112374 b).

ZANTHOXYLUM (Rutaceae)

Z. alatum Roxb.; see *Z. armatum* DC.

Z. armatum DC. syn. *Z. alatum* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 260).

An alkaloid, mp. 160° and spilanthol(2,6,8-decatrienoic isobutylamide) isolated from roots (*Proc. Nat. Acad. Sci. India* 1961, 30A, 160; *Chem. Abstr.* 1962, 56, 10282 d); linalool and essential oil from fruits; essential oil contains limonene, sabinene, linalyl acetate, citral and geraniol (*Indian Oil Soap J.* 1966, 31, 303; *Chem. Abstr.* 1967, 66, 40667 s).

Z. budrunga (Roxb.) DC.; see *Z. rhesta* (Roxb.) DC.

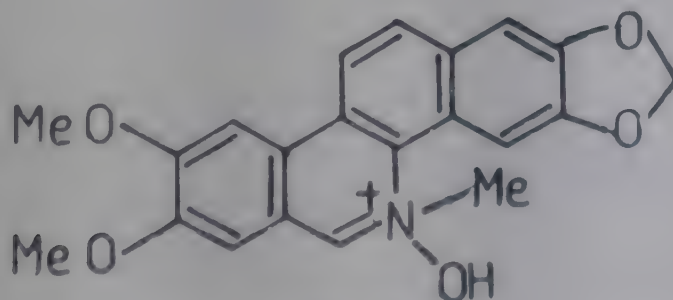
Z. hamiltonianum Wall. ex Hook.f.; see *Z. nitidum* (Roxb.) DC.

Z. limonella (Dennst.) Alston; see *Z. rhesta* (Roxb.) DC.

Z. nitidum (Roxb.) DC. syn. *Z. hamiltonianum* Wall. ex Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 260).

Nitidine isolated as chloride from bark and characterised (*Chem. Ind.* 1958, 1514; *Indian J. Chem.* 1963, 1, 99); β -phellandrene (25), phenylethyl acetate (2.6), methyl cinnamate (4.3), an unknown carbonyl compound (0.75) and a solid compound (0.37%) determined in essential oil (3.5%) from seeds (*Perfum. Essent. Oil Record* 1964, 55, 720; *Chem. Abstr.* 1965, 62, 14417 e); linalool, β -phellandrene and essential oil from seeds (*Indian Oil Soap J.* 1966, 31, 303; *Chem. Abstr.* 1967, 66, 40667 s).

NEW COMPOUNDS



Nitidine

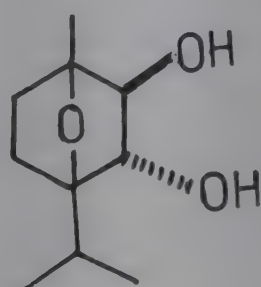
Z. oxyphyllum Edgew. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 260).

Rhetsinine (hydroxyevodiamine) isolated from stem bark (*J. Indian Chem. Soc.* 1964, 41, 857).

Z. rhetsa (Roxb.) DC. syn. *Z. budrunga* (Roxb.) DC., *Z. limonella* (Dennst.) Alston (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 260).

Quinazolone alkaloids - rhetine, chelerythrine, rhetsine, mp. 270°, evodiamine and rhet-sinine (hydroxyevodiamine), mp. 206°, from trunk bark (*Tetrahedron* 1959, 7, 257; *ibid.* 1960, 8, 293); structure elucidation of rhetsinine (*J. Org. Chem.* 1960, 25, 1680; *J. Indian Chem. Soc.* 1964, 41, 857); a monoterpenoid oxido- diol - mullilamdiol, mp. 171° - isolated and found to be identical with oxidation product of sabinene (*Tetrahedron* 1967, 23, 2495).

NEW COMPOUNDS



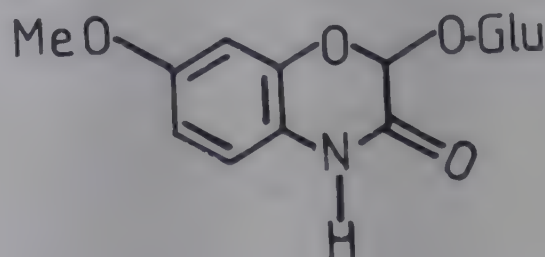
Mullilamdiol

ZEA (Poaceae)

Z. mays L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 260).

Corn pigment in dark-seeded Peruvian variety is believed to be 3-galactosido-cyanidol coumarate (*J. Agric. Trop. Bot. Appl.* 1964, 11, 55; *Chem. Abstr.* 1965, 62, 3062 c); 2-(2-hydroxy-7-methoxy-1,4-benzoxazin-3-one)- β -D-glucoside (I), mp. 228°, isolated from roots and characterised (*Phytochemistry* 1967, 6, 1441).

NEW COMPOUNDS



I

ZEPHYRANTHES (Amaryllidaceae)

Z. robusta Baker

Eng. - Zephyr flower, Thunder flower.

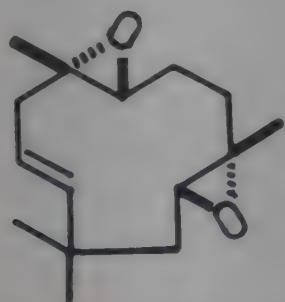
A new alkaloid, mp. 252°, lycorine and haemanthamine from bulbs (*Indian J. Pharm.* 1969, 31, 62).

Distribution : Native to America, grown in Indian gardens as ornamental.

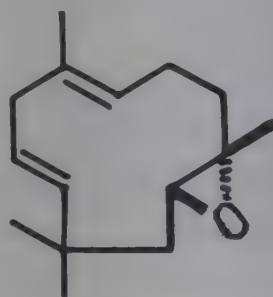
ZINGIBER (Zingiberaceae)

Z. zerumbet (L.) Smith (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 261).

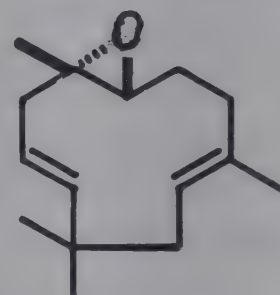
Zerumbone (8-oxohumulene), mp. 66° , from oil, characterised as 2,6,9,9-tetramethyl-2,6,10-cycloundecatrien-1-one (*Perfum. Essent. Oil Record* 1960, 51, 65; *Chem. Abstr.* 1960, 54, 15930 i; *Tetrahedron* 1960, 8, 171); two terpenoids - humulene monoxide and humulene dioxide, mp. 105° - from oil (*Tetrahedron* 1962, 18, 575); two ketones (~ 6), a diepoxide (~ 4), two 2- α -epoxides - humulene epoxide I, bp. $104^{\circ}/1.5$ mm. and humulene epoxide II, bp. 105° (65), and humulenol (~ 3) along with (+) α -curcumene (2%) and caryophyllene epoxide, mp. 61° , from essential oil (*Tetrahedron Lett.* 1963, 1941); chemical studies and absolute stereostructures of humulene epoxides I and II described (*Tetrahedron* 1968, 24, 4123); stereostructure of (+)humulenol-II (humulenol) elucidated (*Tetrahedron* 1968, 24, 4133).

NEW COMPOUNDS

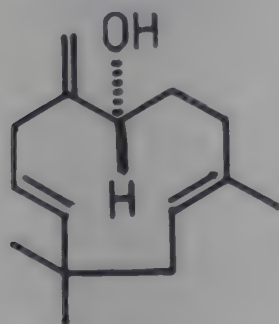
Humulene dioxide



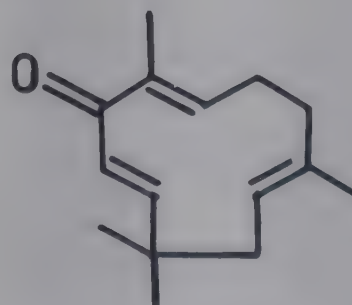
Humulene epoxide I



Humulene epoxide II



(+)Humulenol II



Zerumbone

ZIZIPHORA (Lamiaceae)

Z. clinopodioides Lam. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 261).

Presence of α - and β -pinenes; camphene, β -myrcene, limonene, α -terpinene, p-cymene, terpinolene, menthone, isomenthone, pulegone, isopulegone, butyric acid and thymol detected by chromatography in essential oil (*Izv. Akad. Nauk Kaz. SSR, Ser. Khim. Nauk* 1964, 14, 75; *Chem. Abstr.* 1965, 62, 3881 g).

ZIZYPHUS (Rhamnaceae)

Z. jujuba Lamk.; see *Z. mauritiana* Lamk.

Z. mauritiana Lamk. syn. *Z. jujuba* Lamk. (non Mill.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 261).

Leucocyanidin from bark; leucopelargonidin, betulinic and ceanothic acids from wood (*Curr. Sci.* 1965, 34, 344); rutin from leaves (*Farmatsiya* 1967, 16, 34; *Chem. Abstr.* 1967, 67, 97640 c).

Z. xylopyrus (Retz.) Willd. (*xylopyra*, *xylophora*)

H. - Kat-ber, Gote, Kakor, Ghont; Tel. - Gottte; Tam. - Kottei; Kan. - Challe, Mullukare; Oriya - Got, Gotoboro, Kantabohul.

Betulinic acid from wood and bark (*Curr. Sci.* 1965, 34, 344).

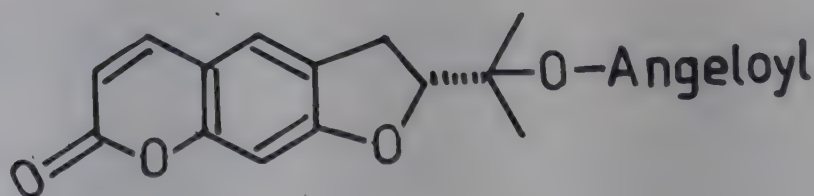
Distribution : North-western India, Uttar Pradesh, Bihar, central and south India.

ZOSIMA (Apiaceae)

Z. absinthifolia (Vent.) syn. *Z. orientalis* Hoffm. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 262).

Two new isomeric coumarins - zosimin, mp. 119° and deltoin, mp. 104° - from roots; eight coumarin lactones isolated from fruits (*Zh. Obshch. Khim.* 1964, 34, 3854; *Chem. Abstr.* 1965, 62, 6454 b; *Khim. Prir. Soedin.* 1965, 1, 220; *Chem. Abstr.* 1965, 63, 13701 g).

NEW COMPOUNDS



Deltoin

Z. orientalis Hoffm.; see *Z. absinthifolia* (Vent.) Link

ZYGOPHYLLUM (Zygophyllaceae)

Z. coccineum L.; see *Z. propinquum* Decne.

Z. propinquum Decne. syn. *Z. coccineum* auct. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 262).

Zygophyllin, mp. 288°, isolated and a saponin and a tannin detected in fruits (*Egypt. Pharm. Bull.* 1958, 40, 97; *Chem. Abstr.* 1960, 54, 18888 g).

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Abbreviations used: B.- Bengal; Bo.- Bombay; Eng.- English; Guj.- Gujrat; H.- Hindi; Kan.- Kanarese; Kash.- Kashmir; Mal.- Malayalam; Mar.- Maharashtra; Nep.- Nepal; P.- Punjab; S.- Sanskrit; Tam.- Tamil; Tel.- Telugu.

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